B L I S T E R   R U S T   W O R K

I N   T H E   F A R   W E S T

January 1 to December 31, 1935.

Blister Rust Control
Division of Plant Disease Control
618 Realty Building
Spokane, Washington

Mosaic of the 1935 bulldozer operation on the Upper West Branch of Priest River on the Kaniksu National Forest. The cleared areas and windrows of piled brush are discernible along the main drainage and tributaries of the Upper West Branch Creek. The wide alluvial bottoms adjacent to streams of this type generally sustain heavy concentrations of *Ribes inerme* growing in close association with other brush species necessitating the clearing of the entire area. After the disposal of the piled brush by burning the area is planted to grass.

Official Photograph
116th. Photo Section
Washington National Guard

CONTENTS

BLISTER RUST WORK IN THE FAR WEST

January 1 to December 31, 1935.

**** - 0 - ****

As 1933 was marked by the use of large numbers of Civilian Conservation Corps laborers in western blister rust control work, and 1934 by the use of men employed by Public Works Administration funds, 1935 was characterized by the use of funds from the Emergency Relief Appropriation Act of 1935 for the employment of men from the relief rolls of the several states for use upon Ribes eradication. Unfortunately these funds were only made available at about the midway point of the normal working season. This fact together with the difficulties encountered in securing the requisite number of laborers sharply limited the output of work during the 1935 field season. In the Inland Empire only about 50 percent of the acreage was covered that is called for in the control plan as developed during the winter of 1934.

The field organization of technical supervision as described in the introduction to the 1934 Annual Report was continued during 1935, and so far as possible the same personnel was used. Limitations regarding the employment of supervisory personnel together with several other factors made it necessary to use somewhat larger camp units than has been the custom in the past where men other than those of the CCC were employed upon Ribes eradication. The average camp as set up under ERA funds contained about 60 men from the relief rolls. The general inexperience of the men eligible for employment and the sharp limitation on the number of hours of work per week definitely limited the output of work under the 1935 program.

In addition to the principal number of men employed under ERA funds approximately 3,500 CCC men were employed on blister rust control in the Inland Empire. There were also in the field a small number of camps supported by regular appropriation funds to the Forest Service and two 32-man camps the labor for which was paid out of appropriations by the State of Idaho. The work in California, Oregon, Wyoming and Colorado was limited to men from the relief rolls.

During 1935 the State of Idaho had available an allotment to blister rust control of $15,000. With this exception all other funds directly expended upon Ribes eradication were allocated by the Federal Government.

During the calendar year 1935 funds were available to the Division of Plant Disease Control in the far western states by allotments from Public Works funds appropriated for the fiscal years 1933-1935 and from which small allotments were made available for the first half of the fiscal year 1936, and our regular appropriation for blister rust control work for the fiscal year 1936. (No regular appropriation for the fiscal year 1935.) On July 11, 1935 allotments were made from Works Progress Administration funds for blister rust control work for the fiscal years 1936-1937. Appropriation titles and allotments are as follows:

Public Works Allotments Fiscal Years 1935-1936:

3-03/5640.24-4, National Industrial Recovery-
Agriculture Entomology and Plant Quarantine
(White Pine Blister Rust) 1933-1935

[illegible]

As 1935 was marked [illegible]
Corps laborers in western [illegible]
employed by Public Works Administration [illegible]
of funds from the Emergency Relief [illegible]
of men from the relief rolls of the [illegible]
Unfortunately these funds were only [illegible]
the normal working season. This [illegible]
in securing the requisite number of [illegible]
during the 1935 field season. In [illegible]
acreage was covered that [illegible]
winter of 1934.

The field organization [illegible]
troduction to the 1934 annual Report was [illegible]
sible the same personnel [illegible]
visory personnel together with [illegible]
somewhat larger camp units [illegible]
than those of the CCC were employed [illegible]
set up under WPA funds [illegible]
inexperience of the men [illegible]
number of hours of work [illegible]
1935 program.

In addition to the [illegible]
approximately [illegible]
Empire. There were [illegible]
appropriation [illegible]
was paid out of [illegible]
Oregon, Wyoming and [illegible]

During 1935 the [illegible]
rust control of [illegible]
upon Ribes eradication [illegible]

During the calendar year [illegible]
Plant Disease Control in the [illegible]
funds appropriated for the [illegible]
were made available for the first half of the fiscal [illegible]
appropriation for [illegible]
appropriation for the fiscal year [illegible]
from Works Progress Administration [illegible]
fiscal years 1936-1937. [illegible]

Public Works Allotments Fiscal Years [illegible]

[illegible]
[illegible]
[illegible]

3-03/7640.24-4, National Industrial Recovery-
Agriculture Entomology and Plant Quarantine
(White Pine Blister Rust) 1933-1937

F. P.	209	Idaho	$ 169,300.00	
F. P.	210	Montana	44,900.00	
F. P.	211	Washington	46,300.00	
F. P.	212	California	210,000.00*	
F. P.	213	Oregon	15,000.00	
F. P.	214	Wyoming	6,000.00	
F. P.	215	Colorado	6,850.00	
F. P.	261	General Expenses	41,350.00	
		Total		$ 539,700.00

3-03/5640.24-1, National Industrial Recovery-
Agriculture Entomology and Plant Quarantine
(Blister Rust Control) 1933-1935

3-03/7640.24-1, National Industrial Recovery-
Agriculture Entomology and Plant Quarantine
(Blister Rust Control) 1933-1937

F. P.	128	Oregon	35,000.00
		Total	$ 574,700.00

Regular Appropriation, Fiscal Year 1936:-

36450.63, Salaries and Expenses Bureau of Entomology and
Plant Quarantine Blister Rust Control.
1936 $ 98,316.46

Works Progress Allotments, Fiscal Year 1936-1937:

001089, Emergency Relief, Agriculture Entomology
and Plant Quarantine, 1935-1937

O. P. 1-136,	California	$ 874,685.00	
O. P. 1-137,	Colorado	28,847.00	
O. P. 1-140,	Idaho	2,270,524.00#	
O. P. 1-147,	Montana	222,230.00	
O. P. 1-153,	Oregon	268,683.00	
O. P. 1-160,	Washington	225,600.00	
O. P. 1-163,	Wyoming	28,847.00	
	Total		$ 3,969,416.00
	Grand Total		$ 4,642,432.46

* California PWA Allotment includes $121,000.00 of original $186,000.00 allotment to Forest Service, Region 5, for cooperative blister rust control work for Fiscal Years 1934-1935.

\# Original Idaho WPA allotment $2,320,524.00 reduced $50,000 to provide an administrative allotment for the Washington, D. C. office of Plant Disease Control.

Funds were expended during the calendar year 1935 from the above appropriations for blister rust control work in the far western states as indicated below:

1. 3-03/5640.24-4 National Industrial Recovery-Agriculture Entomology and Plant Quarantine (White Pine Blister Rust)	1933-1935	$ 163,632.71*
2. 3-03/7640.24-4 National Industrial Recovery-Agriculture Entomology and Plant Quarantine (White Pine Blister Rust)	1933-1937	2,205.70
3. 3-03/5640.24.1 National Industrial Recovery-Agriculture Entomology and Plant Quarantine (Blister Rust Control)	1933-1935	10,864.82
4. 3-03/7640.24.1 National Industrial Recovery-Agriculture Entomology and Plant Quarantine (Blister Rust Control)	1933-1937	191.55
5. 36450.63 Salaries and Expenses Bureau of Entomology and Plant Quarantine Blister Rust Control	1936	50,076.07
6. 001089 Emergency Relief Agriculture Entomology and Plant Quarantine	1935-1937	710,598.70
Total		$ 937,569.55

* $9,391.92 disbursed by A. W. Smith, Regional Fiscal Agent, Region 5 from $121,000 allotment to Forest Service for fiscal year from F. P. 212 California; $154,240.99 expended by Spokane office.

The following is the permanent western personnel who were employed during the period covered by this report:

1. Supervisory:

a. In Charge of Western Branch Office, S. N. Wyckoff, Senior Pathologist.

2. Project Leaders:

a. Ribes Ecological Studies, C. W. Waters, Agent, part time employment.

b. Development of Mechanical Methods of Ribes Eradication, H. E. Swanson, Pathologist, assisted by J. F. Breakey, Agent.

c. Cooperative Local Control, Inland Empire. H. E. Swanson, Pathologist, assisted by Operation Supervisors H. J. Hartman and M. C. Riley, Associate Foresters, C. H. Johnson, F. O. Walters and Neal D. Nelson, Associate Pathologists; Acting Operation Supervisor, F. J. Heinrich, Chief Scientific Aid; Assistant Operation Supervisors, D. J. Moore, M. D. Oaks, L. L. White and V. D. Moss, Agents; Acting Assistant Operation Supervisor, D. Kyle,

Scientific Aid; Field Assistant, Howard D. Langley, Agent; Unit Supervisors, J. P. Reinmuth, J. C. Gynn, C. O. Peterson, S. E. McLaughlin (also in charge of field records and employment of temporary assistants), Agents.

d. Checking and Methods of Ribes Eradication, Inland Empire. E. E. Swanson, Pathologist, assisted by Checking Supervisors H. J. Faulkner, W. F. Painter, A. L. Pence, H. A. Brischle and S. Skoglund. Agents.

e. Cooperative Local Control, National Parks, Washington. H. E. Swanson, Pathologist, assisted by Operation Supervisor M. C. Riley, Associate Forester.

f. Cooperative Local Control, Oregon. W. V. Benedict, Forester, assisted by Acting Operation Supervisor C. P. Wessela, Agent and Acting Assistant Operation Supervisor, R. M. Sovulewski, Agent.

g. Cooperative Local Control, California. W. V. Benedict, Forester, assisted by Operation Supervisors R. Blomstrom and D. R. Miller, Associate Foresters, and F. A. Patty, Associate Pathologist; Acting Operation Supervisor B. Howard, Junior Forester; Assistant Operation Supervisors R. M. Riley and A. London, Agents; Acting Assistant Operation Supervisors E. H. Kincaid and R. A. James, Agents; R. H. Simons, Agent; Frances Greenfield and Catherine Ryan, Junior Clerk-Stenographers.

h. Checking of Ribes Eradication, Oregon and California. W. V. Benedict, Forester assisted by Checking Operation Supervisor, T. H. Harris, Associate Forester; Checking Supervisors, J. N. Mitchell, Assistant Forester, C. W. Fowler, J. C. Crowell, S. D. Adams and L. N. Anderson, Agents.

i. Cooperative Local Control, Colorado and Wyoming. E. L. Joy, Associate Forester, assisted by C. M. Chapman, Agent.

j. Informational Work. R. L. MacLeod, Associate Pathologist, assisted by H. M. Cowling, Chief Scientific Aid and Dale L. Swartz, Agent.

k. Studies on Spread of the Rust and Damage to Pine. E. L. Joy, Associate Forester assisted by C. R. Stillinger, Associate Pathologist.

l. Experimental Chemical Eradication of Ribes. H. R. Offord, Pathologist, assisted by C. R. Quick and G. R. Van Atta, Assistant Pathologists, and R. P. d'Urbal, Assistant Chemist.

3. State Leaders:

a. Montana, C. H. Johnson, Associate Pathologist.

b. California, G. A. Root, Associate Pathologist.

4. Business Administration, Disbursing and Clerical Work:

E. G. Schmidt, Junior Administrative Assistant, assisted by A. H. Glasgow,

Chief Scientific Aid, P. Lockett and E. K. LaPrey, Agents.

M. L. McWold, Senior Clerk, assisted by Mrs. Mildred Hemenway, Assistant Clerk-Stenographer.

Mrs. L. E. Klatt, Clerk, assisted by Miss A. L. Anderson, Assistant Clerk-Stenographer, Miss Clara E. Gjelde, Junior Clerk-Stenographer and Miss Regena R. Rieth, Junior Typist.

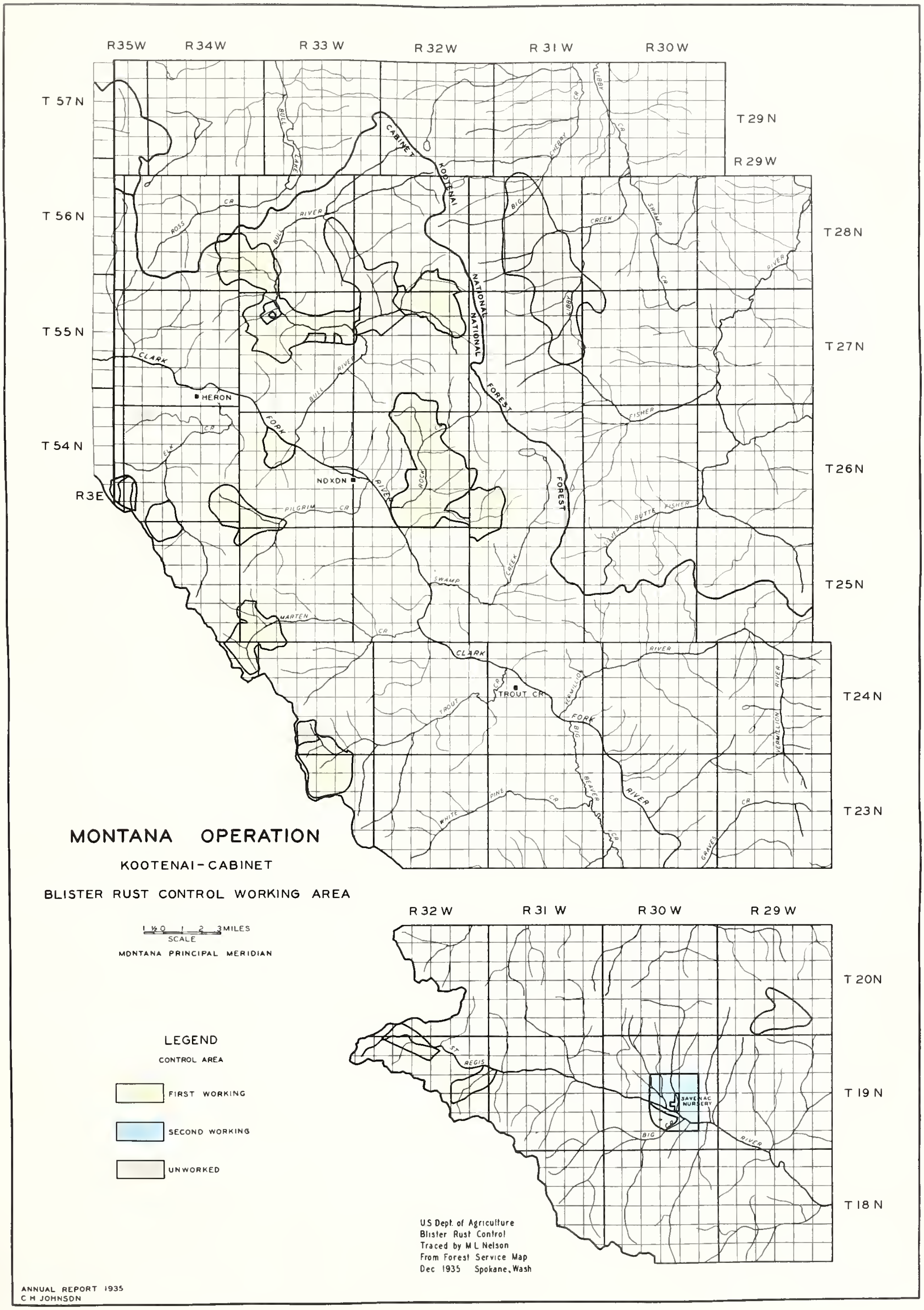
5. Collaborators:

Dr. Carl C. Epling, Los Angeles, California.
A. O. Garrett, Salt Lake City, Utah.
B. O. Longyear, Ft. Collins, Colorado.
Rutledge Parker, Missoula, Montana.

The following personnel have either resigned or been transferred to other Departments of the Government during the period covered by this report: B. A. Anderson, W. G. Guernsey, D. F. Williams, George Heafford, H. F. Geil, W. W. Spinney, W. B. Dunshee, J. C. Ball, W. E. White, R. E. Myers, L. E. Nelson, F. F. Staat, Max G. Bicknell, J. A. Vogtmann, R. P. Edgerton, E. A. Ronning, Mrs. M. C. Dowdy, Miss M. V. Lynch, Mrs. Imogene Hunt, Dr. T. H. Goodspeed, and Dr. E. E. Hubert.

BLISTER RUST CONTROL WORK IN MONTANA
1935

Blister rust control activities in Montana were continued as a cooperative project between the Bureau of Entomology and Plant Quarantine and the Montana Department of Agriculture, Montana State Forestry Department, the School of Forestry, University of Montana, the Blackfoot Protective Association and the Northern Montana Forestry Association.


MONTANA OPERATION
KOOTENAI-CABINET
BLISTER RUST CONTROL WORKING AREA
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SCALE
MONTANA PRINCIPAL MERIDIAN
LEGEND
CONTROL AREA
FIRST WORKING
SECOND WORKING
UNWORKED
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R 33 W
R 32 W
R 31 W
R 30 W
R 29 W
T 57 N
T 56 N
T 55 N
T 54 N
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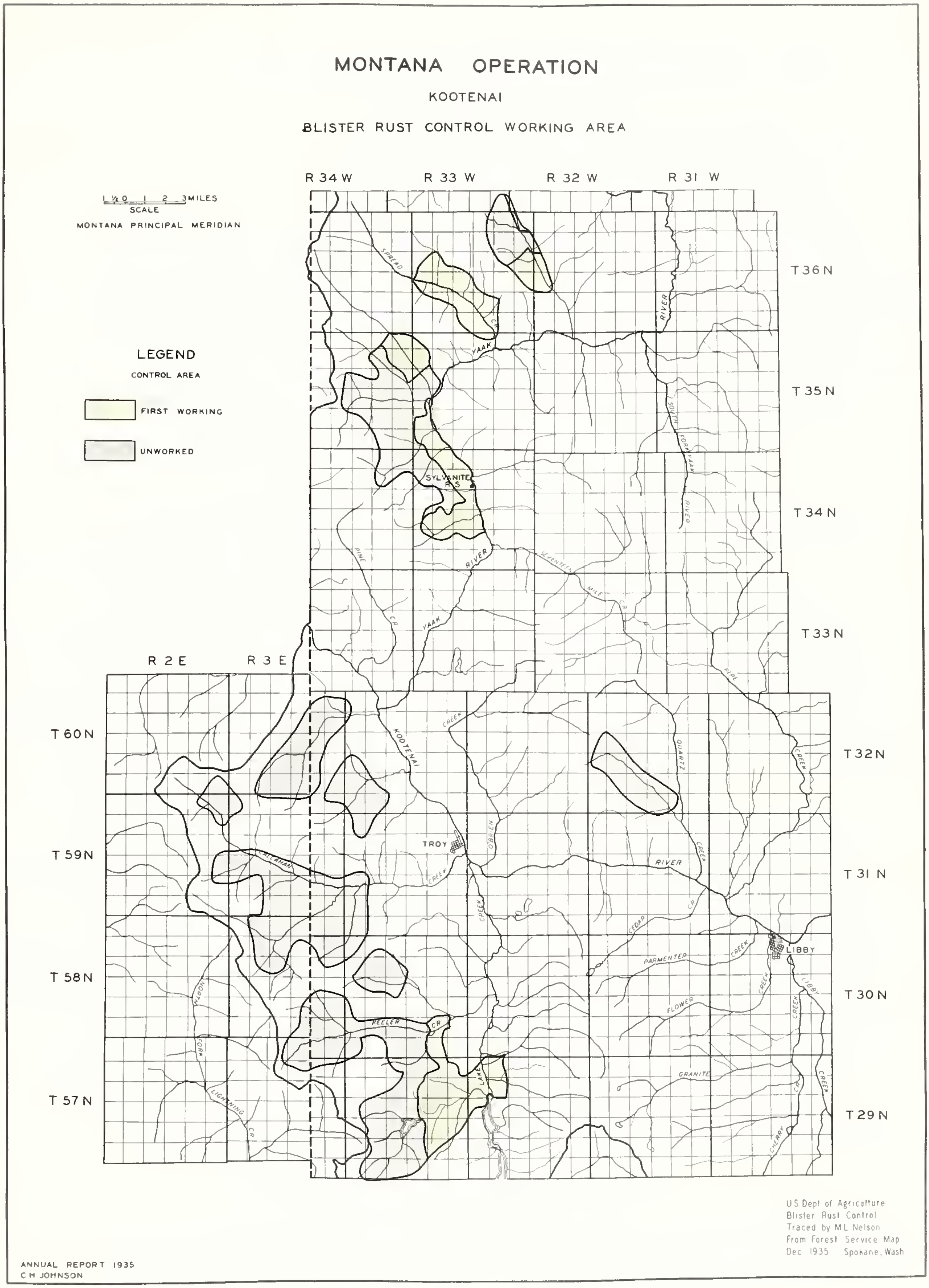
T 27 N
T 26 N
T 25 N
T 24 N
T 23 N
T 20 N
T 19 N
T 18 N
CABINET
KOOTENAI
NATIONAL
FOREST
HERON
NOXON
TROUT CR
SAVENAC NURSERY
CLARK FORK RIVER
BULL RIVER
ST REGIS
US Dept. of Agriculture
Blister Rust Control
Traced by M L Nelson
From Forest Service Map
Dec 1935 Spokane, Wash
ANNUAL REPORT 1935
C H JOHNSON


MONTANA OPERATION
KOOTENAI
BLISTER RUST CONTROL WORKING AREA
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PIPE
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CREEK
QUARTZ
TROY
OBRIEN
CREEK
RIVER
CALLAHAN
CREEK
CEDAR
CR
PARMENTER
CREEK
LIBBY
FLOWER
CREEK
NORTH FORK
LIGHTNING CR
KEELER CR
LAKE
GRANITE
CHERRY
CREEK
US Dept of Agriculture
Blister Rust Control
Traced by M L Nelson
From Forest Service Map
Dec 1935 Spokane, Wash
ANNUAL REPORT 1935
C H JOHNSON

RIBES ERADICATION, MONTANA OPERATION, 1935

By

C. H. Johnson

Associate Pathologist

INTRODUCTION

Blister rust operations for the 1935 field season were started in Montana following the arrival of CCC companies about the middle of May. Two camps were established on the Kootenai National Forest to engage in blister rust control and forest improvement work. The event marked the first Ribes eradication work on that forest. Due to unforeseen difficulties, the major program was greatly delayed. The first of six ERA camps was established on July 30 and the last on August 26. However, a season of diminished fire hazard together with a late fall were compensating factors permitting eradication crews to remain in the field until the middle of October. A large number of men from relief rolls were afforded an opportunity to engage in healthy and useful work.

LOCATION AND DESCRIPTION OF AREA

Two ERA camps on the Cabinet National Forest were located on Bull River near the northern boundary of the forest.

The stream type areas are wide. Over a long period of years these bottom lands once covered with white pine and cedar have reverted to open stands of brush which are conducive to Ribes growth. Fires of early origin swept through the uplands in this region, but today a fair stand of second growth white pine again covers the landscape. Ribes inerme constitutes the dominant host plant along the river. R. viscosissimum occurs over burns and brushy areas in the upland and R. lacustre predominates along the side streams. R. petiolare is not known to occur in the northern portion of the Cabinet National Forest. Working conditions range from medium to heavy.

On the Kootenai National Forest, one CCC camp and one ERA camp were located south of Troy. One CCC camp and three ERA camps were located north of Troy along the Yaak River.

Some of the best white pine areas on the Kootenai National Forest were until recent years only accessible by trail. New roads built and under construction will materially facilitate the blister rust control program.

The same species of Ribes that occur in the Cabinet National Forest are present. A species of Ribes thought to be R. laxiflorum was found in the vicinity of Spar Lake and Keeler Creek. Some eradication of this species will be necessary during the 1936 field season.

Working conditions on the Kootenai Forest may be classed as about medium.

METHODS AND EQUIPMENT

Each camp boss instructed his men as to the identification of Ribes and eradication procedure. Every effort was made by the supervisory force to

locate through scouting and advance stripping patches of Ribes with a view to concentrating on these areas and thereby preventing needless search for Ribes by eradication crews over areas free from Ribes.

Handpulling with the aid of grubbing tools is adaptable to the general region. This method was used on all camp areas. The decapitation method, consisting of the application of borax to crowns of R. viscosissimum which had been cut above the ground was tried in an experimental way on several areas.

Standards of efficiency essential to effective control were carefully followed. There was an increase in the amount of acreage worked per man day due in part to the lighter Ribes concentrations encountered as compared to the previous year.

ORGANIZATION AND ADMINISTRATION

The organization chart illustrates the manner in which the work was administered.

The Forest Service although not actively engaged to the extent of establishing blister rust camps, cooperated in every way possible. Two men paid from Forest Service funds aided in stripping and advance surveys to eliminate Ribes free areas. Valuable assistance was rendered by furnishing pack stock to move supplies and equipment to camps reached by trail. The success of the program was in a large measure due to the active participation and interest manifest at all times by the supervisory personnel of the Forest Service.

Field headquarters was established at Troy, Montana. The ERA camps on both the Kootenai and Cabinet forests were supplied from this point.

CHECKING

The checking organization performed the regular check on all worked areas and in addition, cooperated with and assisted the eradication forces to the fullest extent.

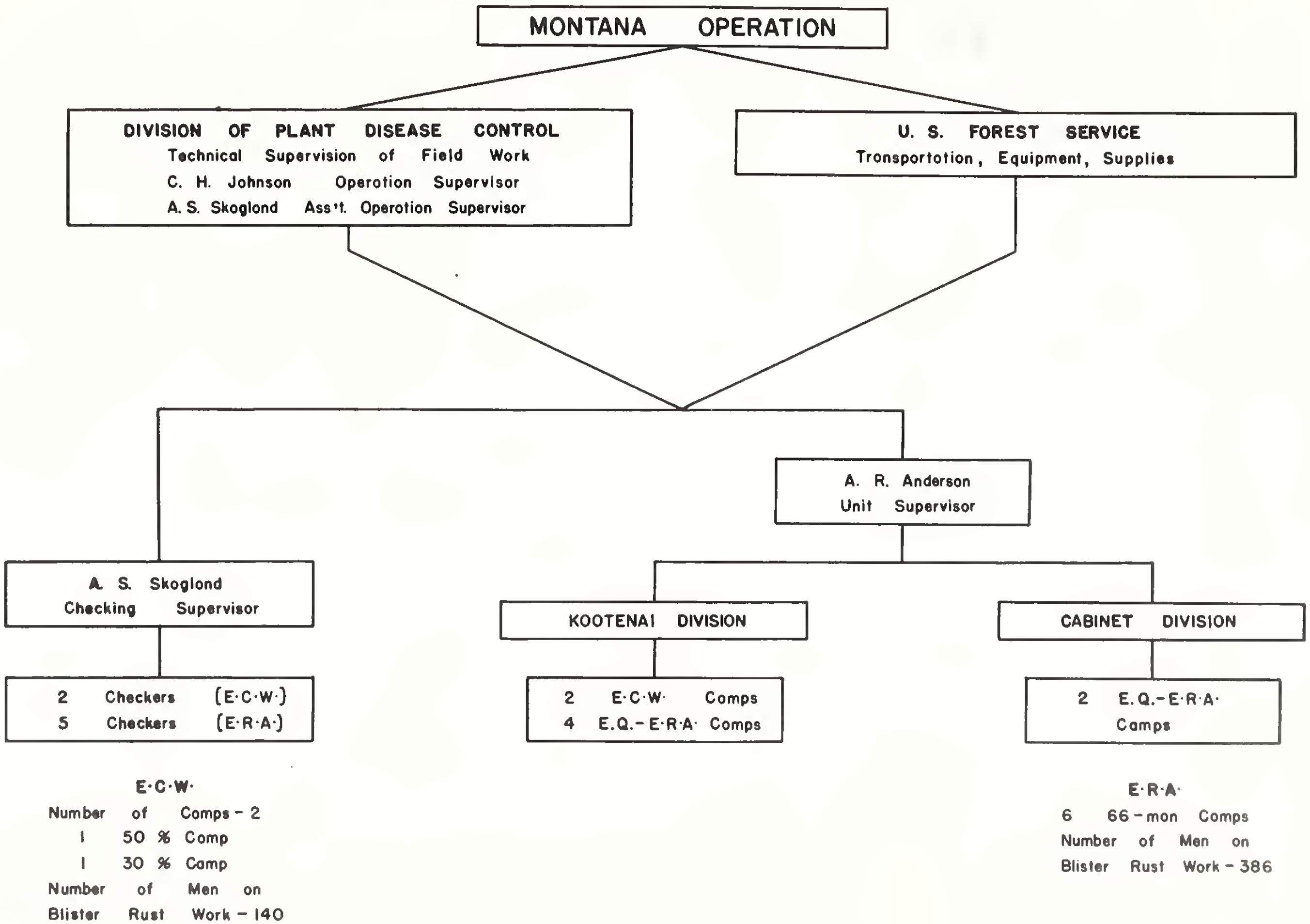
An advance survey was run on all areas to be worked for the purpose of determining types and Ribes distribution. This survey was performed by running parallel strips in cardinal directions every ten chains on an area, checking a strip 30 feet wide and recording number of Ribes bushes and feet of live stem. On areas found to be relatively free of Ribes another strip was run in between the ten-chain strips and from these data Ribes-free areas were blocked out and eliminated from crew work, thereby cutting eradication costs materially.

The checkers in the ERA camps checked 15,631 acres at a cost of $.093 per acre. The checkers in the ECW camps checked 10,248 acres at a cost of $.097 per acre. The average per acre cost for the entire 25,879 acres was $.094 per acre.

STATEMENT OF EXPENDITURES AND COSTS

The statement of expenditures and costs includes those funds expended from appropriations directly allotted to the Bureau of Entomology and Plant Quarantine and the United States Forest Service. The direct appropriations to the

ORGANIZATION CHART



Totol Number of Men on Blister Rust Work - 526

ANNUAL REPORT 1935
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Bureau of Entomology and Plant Quarantine were those allotted under NIRA, the Emergency Relief Act, and the regular appropriations for blister rust control work. A small amount of money was contributed by the Forest Service from regular blister rust funds to retain technical supervisors for ECW work.

No complete costs are available for ECW work except those incurred by the Bureau of Entomology and Plant Quarantine in the course of providing technical supervision to ECW work.

Effective man days in the following tabulations represent eight hours of work in the field by men actually engaged in the eradication of Ribes.

On account of the late season start of the ERA work and the maintenance of the camps in the field later than the normal operating season, the number of effective man days under this program for the 1935 season is considerably lower in relation to costs than it would be in the case of a full season of work. Consequently, the cost per effective man day is higher than it would be under normal conditions.

TABLE NO. 1

EXPENDITURES BY APPROPRIATIONS CALENDAR YEAR 1935
MONTANA OPERATION

Cooperating Agency	Appropriation	Amount
Forest Service	Regular	$ 810.40
Bureau of Entomology and Plant Quarantine	Nira	12,788.99
	Regular	1,962.93
	ERA	53,743.46
	Total	68,495.38
Total Expenditures	All Appropriations	$69,305.78

TABLE NO. 2

CLASSIFIED EXPENDITURES, CALENDAR YEAR 1935
MONTANA OPERATION

Item	Forest Service Regular	Bureau of Entomology and Plant Quarantine				Total
		NIRA	Regular	ERA	Total	
Salaries, permanent men	$	$ 1,608.72	$1,650.00	$ 866.64	$ 4,125.36	$ 4,125.36
Salaries, temporary appointed men	810.40	101.60	258.93	5,050.16	5,410.69	6,221.09
Wages, temporary laborers		1,842.47		28,985.55	30,828.02	30,828.02
Subsistence supplies		431.68		13,647.32	14,079.00	14,079.00
Equipment		233.37		171.01	404.38	404.38
Trucks				875.36	875.36	875.36
Travel and transportation		954.48	52.50	1,751.99	2,758.97	2,758.97
Twine		7,000.00			7,000.00	7,000.00
Other supplies and expenses		616.67	1.50	2,395.43	3,013.60	3,013.60
Total	810.40	12,788.99	1,962.93	53,743.46	68,495.38	69,305.78
Less 2/3 cost of new equipment		155.58		989.36	1,144.94	1,144.94
Less cost of unused supplies		6,800.00			6,800.00	6,800.00
Plus 1/3 cost of old equipment		1,558.30			1,558.30	1,558.30
Plus 1934 preeradication		902.74			902.74	902.74
Net cost 1935 operation	$810.40	$ 8,294.45	$1,962.93	$52,754.10	$63,011.48	$63,821.88

The effective 8-hour man day cost on ERA work was $7.55 based on a net cost of operation of $61,093.38. The remainder of the total net cost of operation ($2,728.50) was chargeable to supervising ECW work. The average cost per meal in ERA camps was $.219.

SUMMARY OF RIBES ERADICATION, 1935
MONTANA OPERATION

TABLE NO. 3 - SUMMARY OF ALL WORKINGS

Forest	Eradication Type	Acres First Working	Acres Second Working	Total Effective Man Days	Total Ribes	Ribes Remaining Per Acre	
						Bushes	Live Stem
Kootenai	Open Reproduction	4,820		2,474	442,295	1.5	6.8
	Dense Reproduction	1,231		232	20,352	1.3	6.0
	Open Pole	6,621		2,574	253,556	1.1	6.9
	Dense Pole	2,661		168	11,189	.6	1.9
	Open Mature	2,684		999	147,227	1.3	6.7
	Dense Mature	3,390		30	4,184	.2	1.4
	Brush	107		93	7,952	2.5	12.4
	Meadow-Field	103		1			
	All Upland	21,617		6,571	886,755	1.2	5.5
	Stream (Hand)	1,241		4,139	625,647	3.1	10.8
	All Types	22,858		10,710	1,512,402	1.5	6.4
Cabinet	Open Reproduction	75	134	194	29,250	1.0	11.7
	Open Pole	1,867	221	519	64,424	.4	1.1
	Dense Pole	226	92	212	52,077	.5	2.0
	Brush	238					
	Meadow-Field	348		150	12,131		
	All Upland	2,754	447	1,075	157,882	.3	1.2
	Stream (Hand)	408	26	1,760	355,571	5.2	17.8
	All Types	3,162	473	2,835	513,453	1.0	4.9
All Forests	Open Reproduction	4,895	134	2,668	471,545	1.5	6.7
	Dense Reproduction	1,231		232	20,352	1.4	6.0
	Open Pole	8,488	221	3,093	317,980	1.1	5.6
	Dense Pole	2,887	92	380	63,266	.6	1.7
	Open Mature	2,684		999	147,227	1.3	6.7
	Dense Mature	3,390		30	4,184	.2	1.4
	Brush	345		93	7,952	.7	3.9
	Meadow-Field	451		151	12,131		
	All Upland	24,371	447	7,646	1,044,637	1.1	5.0
	Stream (Hand)	1,649	26	5,899	981,218	3.5	11.8
	All Types	26,020	473	13,545	2,025,855	1.5	6.2

TABLE NO. 3A - FIRST WORKING

Forest	Eradication Type	Acres	Effective Man Days	Total Ribes	Per Acre Basis		Ribes Remaining Per Acre	
					Man Days	Ribes	Bushes	Live Stem
Kootenai	Open Reproduction	4,820	2,474	442,295	.52	92	1.5	6.8
	Dense Reproduction	1,231	232	20,352	.19	16	1.3	6.0
	Open Pole	6,621	2,574	253,556	.39	38	1.1	6.9
	Dense Pole	2,661	168	11,189	.06	4	.6	1.9
	Open Mature	2,684	999	147,227	.37	55	1.3	6.7
	Dense Mature	3,390	30	4,184	.01	1	.2	1.4
	Brush	107	93	7,952	.87	74	2.5	12.4
	Meadow-Field	103	1		.01			
	All Upland	21,617	6,571	886,755	.30	41	1.2	5.5
	Stream (Hand)	1,241	4,139	625,647	3.34	504	3.1	10.8
	All Types	22,858	10,710	1,512,402	.47	66	1.5	6.4
Cabinet	Open Reproduction	75					1.0	11.7
	Open Pole	1,867	287	39,327	.15	21	.4	1.1
	Dense Pole	226	183	50,976	.81	226	.5	2.0
	Brush	238						
	Meadow-Field	348	150	12,131	.43	35		
	All Upland	2,754	620	102,434	.23	37	.3	1.2
	Stream (Hand)	408	1,727	352,918	4.23	865	5.2	17.8
	All Types	3,162	2,347	455,352	.75	144	1.4	4.9
All Forests	Open Reproduction	4,895	2,474	442,295	.51	90	1.5	6.7
	Dense Reproduction	1,231	232	20,352	.19	16	1.4	6.0
	Open Pole	8,488	2,861	292,883	.34	35	1.1	5.6
	Dense Pole	2,887	351	62,165	.12	22	.6	1.7
	Open Mature	2,684	999	147,227	.37	55	1.3	6.7
	Dense Mature	3,390	30	4,184	.01	1	.2	1.4
	Brush	345	93	7,952	.27	23	.7	3.9
	Meadow-Field	451	151	12,131	.33	27		
	All Upland	24,371	7,191	989,189	.30	41	1.1	5.0
	Stream (Hand)	1,649	5,866	978,565	3.56	593	3.5	11.8
	All Types	26,020	13,057	1,967,754	.50	76	1.5	6.2

TABLE NO. 3B - SECOND WORKING

Forest	Eradication Type	Acres	Effective Man Days	Total Ribes	Per Acre Basis		Ribes Remaining Per Acre	
					Man Days	Ribes	Bushes	Live Stem
Cabinet	Open Reproduction	134	194	29,250	1.45	218		
	Open Pole	221	232	25,097	1.05	114	2.7	3.8
	Dense Pole	92	29	1,101	.31	12		
	All Upland	447	455	55,448	1.02	124		
	Stream (Hand)	26	33	2,653	1.27	102	1.0	1.0
	All Types	473	488	58,101	1.03	123		

TABLE NO. 4

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1935
MONTANA OPERATION

Working	Class	Acres	Effective Man Days	Total Ribes	Per Acre Basis		Ribes Remaining Per Acre	
					Man Days	Ribes	Bushes	Live Stem
First	EQ-ERA	15,772	7,600	1,126,686	.48	71	1.1	6.6
	F-ECW	10,248	5,457	841,068	.53	82	1.0	6.0
Second	EQ-ERA	473	488	58,101	1.03	123	2.7	3.8
All Workings	EQ-ERA	16,245	8,088	1,184,787	.50	73	1.1	6.4
	F-ECW	10,248	5,457	841,068	.53	82	1.0	6.0

TABLE NO. 5

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1935
MONTANA OPERATION

Forest	Working	Number of Acres Worked by Ownership Classes		Total
		Federal	Private	
Kootenai	First	20,951	1,907	22,858
Cabinet	First	1,370	1,792	3,162
	Second	393	80	473
	All Workings	1,763	1,872	3,635
Kootenai and Cabinet	First	22,321	3,699	26,020
	Second	393	80	473
	All Workings	22,714	3,779	26,493

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TABLE NO. 6

RESULTS OF CHECKING ON AREAS WORKED, 1935
MONTANA OPERATION

Forest	Eradication Type	Average Results for All Areas												Areas With More Than 25 Feet Live Stem Per Acre		
				Ribes Per Acre												
				Ribes lacustre		Ribes viscosissimum		Ribes inerme		Ribes irriguum		All Species			Per Acre	
		Acres in Checked Area	Acres Checked	Bushes	Live Stem	Bushes	Live Stem	Bushes	Live Stem	Bushes	Live Stem	Bushes	Live Stem	Acres	Bushes	Live Stem
Kootenai	Open Reproduction	4,820	193.50	.8	4.0	.5	2.4	.1	.1	.1	.3	1.5	6.8	335	18	129
	Dense Reproduction	1,231	42.64	1.0	4.9	.3	1.1					1.3	6.0			
	Open Pole	6,621	263.68	.7	4.3	.3	2.5	.1	.1			1.1	6.9	88	6	45
	Dense Pole	2,661	90.50	.5	1.8	.1	.1					.6	1.9			
	Open Mature	2,684	108.96	.7	3.9	.6	2.8					1.3	6.7	62	33	135
	Dense Mature	3,390	112.30	.2	1.4							.2	1.4			
	Brush	107	4.28	.5	4.2	2.0	8.2					2.5	12.4	42	7	45
	Meadow-Field	103	4.14													
	All Upland	21,617	820.00	.7	3.5	.3	1.8	.1	.1	.1	.1	1.2	5.5	527	17	109
	Stream	1,241	177.44	2.6	8.7	.1	.3	.4	1.8			3.1	10.8	45	11	46
	All Types	22,858	997.44	1.0	4.4	.3	1.6	.1	.3	.1	.1	1.5	6.4	572	15	87
Cabinet	Open Reproduction	75	3.00							1.0	11.7	1.0	11.7	20	8	80
	Open Pole	1,921	77.32	.2	.3	.1	.2			.1	.8	.4	1.1			
	Dense Pole	152	6.08			.5	2.0					.5	2.0			
	Brush	238	9.54													
	Meadow-Field	348	15.38													
	All Upland	2,734	111.32	.1	.2	.1	.2			.1	.6	.3	1.2	20	8	80
	Stream	287	31.66	.9	2.8	.1	.1	4.2	14.9			5.2	17.8	62	9	30
	All Types	3,021	142.88	.3	.8	.1	.2	.9	3.3	.1	.6	1.4	4.9	82	9	37
Kootenai and Cabinet	Open Reproduction	4,895	196.50	.8	3.9	.5	2.3	.1	.1	.1	.4	1.5	6.7	355	17	126
	Dense Reproduction	1,231	42.64	1.1	4.9	.3	1.1					1.4	6.0			
	Open Pole	8,542	341.00	.6	3.4	.3	2.0	.1	.1	.1	.1	1.1	5.6			
	Dense Pole	2,813	96.58	.5	1.6	.1	.1					.6	1.7			
	Open Mature	2,684	108.96	.7	3.9	.6	2.8					1.3	6.7	62	33	135
	Dense Mature	3,390	112.30	.2	1.4							.2	1.4			
	Brush	345	13.82	.1	1.3	.6						.7	3.9	42	7	45
	Meadow-Field	451	19.52													
	All Upland	24,351	931.32	.6	3.1	.3	1.7	.1	.1	.1	.1	1.1	5.0	547	16	108
	Stream	1,528	209.10	2.4	7.8	.1	.2	1.0	3.8			3.5	11.8	107	10	37
	All Types	25,879	1,140.42	.9	4.0	.3	1.4	.2	.7	.1	.1	1.5	6.2	654	14	79

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TABLE NO. 7

TOTAL RIBES BY SPECIES ERADICATED, 1935
MONTANA OPERATION

Working	Eradication Type	Acres	Ribes by Species					Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	Ribes irriguum	
First	Open Reproduction	4,895	299,788	84,339		4,279	53,889	442,295
	Dense Reproduction	1,231	19,675	677				20,352
	Open Pole	8,488	200,400	59,982		27,746	4,755	292,883
	Dense Pole	2,887	27,354	25,675		7,650	1,486	62,165
	Open Mature	2,684	125,454	21,773				147,227
	Dense Mature	3,390	4,183	1				4,184
	Brush	345	6,876	1,076				7,952
	Meadow-Field	451	5,010			7,121		12,131
	All Upland	24,371	688,740	193,523		46,796	60,130	989,189
	Stream	1,649	368,818	7,960	131	601,656		978,565
	All Types	26,020	1,057,558	201,483	131	648,452	60,130	1,967,754
Second	Open Reproduction	134	4,937	18,744		4,650	919	29,250
	Open Pole	221	5,998	16,972		2,106	21	25,097
	Dense Pole	92	698	118		285		1,101
	All Upland	447	11,633	35,834		7,041	940	55,448
	Stream	26	979			1,674		2,653
	All Types	473	12,612	35,834		8,715	940	58,101
All Workings	Open Reproduction	5,029	304,725	103,083		8,929	54,808	471,545
	Dense Reproduction	1,231	19,675	677				20,352
	Open Pole	8,709	206,398	76,954		29,852	4,776	317,980
	Dense Pole	2,979	28,052	25,793		7,935	1,486	63,266
	Open Mature	2,684	125,454	21,773				147,227
	Dense Mature	3,390	4,183	1				4,184
	Brush	345	6,876	1,076				7,952
	Meadow-Field	451	5,010			7,121		12,131
	All Upland	24,818	700,373	229,357		53,837	61,070	1,044,637
	Stream	1,675	369,797	7,960	131	603,330		981,218
	All Types	26,493	1,070,170	237,317	131	657,167	61,070	2,025,855

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SUMMARY OF RIBES ERADICATION, 1928-1935
MONTANA OPERATION

TABLE NO. 8 - SUMMARY OF ALL WORKINGS

Forest	Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Effective Man Days	Total Ribes	Gallons Spray
Kootenai	Open Reproduction	4,820			2,474	442,295	
	Dense Reproduction	1,231			232	20,352	
	Open Pole	6,621			2,574	253,556	
	Dense Pole	2,661			168	11,189	
	Open Mature	2,684			999	147,227	
	Dense Mature	3,390			30	4,184	
	Brush	107			93	7,952	
	Meadow-Field	103			1		
	All Upland	21,617			6,571	886,755	
	Stream (Hand)	1,241			4,139	625,647	
	All Types	22,858			10,710	1,512,402	
Cabinet	Open Reproduction	16,893	134		9,300	2,620,066	
	Dense Reproduction	1,612			438	71,747	
	Open Pole	13,405	221		5,394	1,153,600	
	Dense Pole	2,491	92		930	209,928	
	Open Mature	6,618			3,206	882,971	
	Dense Mature	557			88	8,566	
	Brush	2,431			1,895	573,939	
	Meadow-Field	348			150	12,131	
	All Upland	44,355	447		21,401	5,532,948	
	Stream (Hand)	2,766	26		5,680	1,786,063	
	Stream (Chemical)	262			420	31,251	10,417
	Stream (Slash)	7			150	3,500	
	All Stream	2,795	26		6,250	1,822,814	
	All Types	47,150	473		27,651	7,355,762	
Savenac Nursery	Open Reproduction	764			542	134,000	
	Stream (Hand)	619	619	619	2,713	462,981	
	Stream (Chemical)	207	62		832	136,400	34,795
	Stream (Slash)			40	642	20,000	
	All Stream	619	619	619	4,157	679,381	
	All Types	1,383	619	619	4,729	813,381	
All Forests	Open Reproduction	22,477	134		12,316	3,196,361	
	Dense Reproduction	2,843			670	92,099	
	Open Pole	20,026	221		7,968	1,407,156	
	Dense Pole	5,152	92		1,098	221,117	
	Open Mature	9,302			4,205	1,030,198	
	Dense Mature	3,947			118	12,750	
	Brush	2,538			1,988	581,891	
	Meadow-Field	451			151	12,131	
	All Upland	66,736	447		28,514	6,553,703	
	Stream (Hand)	4,648	645	619	12,532	2,876,691	
	Stream (Chemical)	469	62		1,252	227,651	45,212
	Stream (Slash)	7		40	792	23,500	
	All Stream	4,655	645	619	14,576	3,127,842	
	All Types	71,391	1,092	619	43,190	9,681,545	

TABLE NO. 8A - FIRST WORKING

Forest	Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis: Man Days	Per Acre Basis: Ribes
Kootenai	Open Reproduction	4,820	2,474	442,295		.52	92
	Dense Reproduction	1,231	232	20,352		.19	16
	Open Pole	6,621	2,574	253,556		.39	38
	Dense Pole	2,661	168	11,189		.06	4
	Open Mature	2,684	999	147,227		.37	55
	Dense Mature	3,390	30	4,184		.01	1
	Brush	107	93	7,952		.87	74
	Meadow-Field	103	1			.01	
	All Upland	21,617	6,571	886,755		.30	41
	Stream	1,241	4,139	625,647		3.34	504
	All Types	22,858	10,710	1,512,402		.47	66
Cabinet	Open Reproduction	16,893	9,106	2,590,816		.54	153
	Dense Reproduction	1,612	438	71,747		.27	45
	Open Pole	13,405	5,162	1,128,503		.39	84
	Dense Pole	2,491	901	208,827		.36	84
	Open Mature	6,618	3,206	882,971		.48	134
	Dense Mature	557	88	8,566		.16	15
	Brush	2,431	1,895	573,939		.78	236
	Meadow-Field	348	150	12,131		.43	35
	All Upland	44,355	20,946	5,477,500		.47	123
	Stream (Hand)	2,786	5,647	1,785,410		2.03	641
	Stream (Chemical)	262	420	31,251	10,417	1.60	119
	Stream (Slash)	7	150	3,500		21.43	500
	All Stream	2,795	6,217	1,820,161		2.22	651
	All Types	47,150	27,163	7,297,661		.58	155
Savenac Nursery	Open Reproduction	764	542	134,000		.71	175
	Stream (Hand)	619	1,044	144,300		2.53	350
	Stream (Chemical)	207	729	184,000	30,665	3.52	889
	All Stream	619	1,773	328,300		2.86	530
	All Types	1,383	2,315	462,300		1.67	334
All Forests	Open Reproduction	22,477	12,122	3,167,111		.54	141
	Dense Reproduction	2,843	670	92,099		.24	32
	Open Pole	20,026	7,736	1,382,059		.39	69
	Dense Pole	5,152	1,069	220,116		.21	43
	Open Mature	9,302	4,205	1,030,198		.45	111
	Dense Mature	3,947	118	12,750		.03	3
	Brush	2,538	1,988	581,891		.78	229
	Meadow-Field	451	151	12,131		.33	27
	All Upland	66,736	28,059	6,498,255		.42	97
	Stream (Hand)	4,648	10,630	2,555,357		2.44	575
	Stream (Chemical)	469	1,149	215,251	41,082	2.45	459
	Stream (Slash)	7	150	3,500		21.43	500
	All Stream	4,655	12,129	2,774,108		2.61	596
	All Types	71,391	40,186	9,272,363		.56	130

TABLE NO. 8B - SECOND WORKING

Forest	Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis: Man Days	Per Acre Basis: Ribes
Cabinet	Open Reproduction	134	194	29,250		1.45	218
	Open Pole	221	232	25,097		1.05	114
	Dense Pole	92	29	1,101		.31	12
	All Upland	447	455	55,448		1.02	124
	Stream (Hand)	26	33	2,653		1.27	102
	All Types	473	488	58,101		1.03	123
Savenac Nursery	Stream (Hand)	619	877	287,010		1.57	515
	Stream (Chemical)	62	103	12,400	4,130	1.66	200
	All Stream	619	980	299,410		1.58	484
	All Types	619	980	299,410		1.58	484
All Forests	Open Reproduction	134	194	29,250		1.45	218
	Open Pole	221	232	25,097		1.05	114
	Dense Pole	92	29	1,101		.31	12
	All Upland	447	455	55,448		1.02	124
	Stream (Hand)	645	910	289,663		1.56	497
	Stream (Chemical)	62	103	12,400	4,130	1.67	200
	All Stream	645	1,013	302,063		1.57	468
	All Types	1,092	1,468	357,511		1.36	327

TABLE NO. 8C - THIRD WORKING

Forest	Eradication Type	Acres	Effective Man Days	Total Ribes	Per Acre Basis: Man Days	Per Acre Basis: Ribes
Savenac Nursery	Stream (Hand)	619	792	31,671	1.28	51
	Stream (Slash)	40	642	20,000	16.05	500
	All Stream	619	1,434	51,671	2.32	83

TABLE NO. 9

TOTAL RIBES BY SPECIES ERADICATED, 1928-1935
MONTANA OPERATION

Working	Eradication Type	Acres	Ribes by Species						Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	Ribes irriguum	Ribes triste	
First	Open Reproduction	22,477	1,350,183	1,662,323	1,296	52,969	99,195	1,145	3,167,111
	Dense Reproduction	2,843	49,460	41,601			1,038		92,099
	Open Pole	20,026	669,713	579,129		84,479	48,738		1,382,059
	Dense Pole	5,152	125,660	77,768		8,179	8,409		220,016
	Open Mature	9,302	873,506	136,883		11,080	8,729		1,030,198
	Dense Mature	3,947	12,329	421					12,750
	Brush	2,538	285,698	285,771		5,260	5,162		581,891
	Meadow-Field	451	5,010			7,121			12,131
	All Upland	66,736	3,371,559	2,783,896	1,296	169,088	171,271	1,145	6,498,255
	Stream	4,655	1,543,094	65,112	134,834	1,008,518	5,744	16,806	2,774,108
	All Types	71,391	4,914,653	2,849,008	136,130	1,177,606	177,015	17,951	9,272,363
Second	Open Reproduction	134	4,937	18,744		4,650	919		29,250
	Open Pole	221	5,998	16,972		2,106	21		25,097
	Dense Pole	92	698	118		285			1,101
	All Upland	447	11,633	35,834		7,041	940		55,448
	Stream	645	979		17,010	284,074			302,063
	All Types	1,092	12,612	35,834	17,010	291,115	940		357,511
Third	Stream	619			7,552	44,119			51,671
All Workings	Open Reproduction	22,611	1,355,120	1,681,067	1,296	57,619	100,114	1,145	3,196,361
	Dense Reproduction	2,843	49,460	41,601			1,038		92,099
	Open Pole	20,247	675,711	596,101		86,585	48,759		1,407,156
	Dense Pole	5,244	126,358	77,886		8,464	8,409		221,117
	Open Mature	9,302	873,506	136,883		11,080	8,729		1,030,198
	Dense Mature	3,947	12,329	421					12,750
	Brush	2,538	285,698	285,771		5,260	5,162		581,891
	Meadow-Field	451	5,010			7,121			12,131
	All Upland	67,183	3,383,192	2,819,730	1,296	176,129	172,211	1,145	6,553,703
	Stream	5,919	1,544,073	65,112	159,396	1,336,711	5,744	16,806	3,127,842
	All Types	73,102	4,927,265	2,884,842	160,692	1,512,840	177,955	17,951	9,681,545

TABLE NO. 10

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1927-1935
MONTANA OPERATION

Working	Number of Acres Worked by Ownership Classes			Total Acres
	Federal	State - Montana	Private	
First	60,500	435	10,456	71,391
Second	1,012		80	1,092
Third	619			619
All Workings	62,131	435	10,536	73,102

TABLE NO. 11

PROGRESS OF FIRST WORKING BY OWNERSHIP CLASSES, 1927-1935
MONTANA OPERATION

Ownership Class	Number of Acres		
	Worked	Unworked	Total
Federal	60,500	78,227	138,727
State-Montana	435		435
Private	10,456	4,832	15,288
Total	71,391	83,059	154,450

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BLISTER RUST CONTROL WORK IN IDAHO
1935

Blister Rust Control activities in Idaho were continued as a cooperative project in accordance with the agreement originally executed between the Bureau of Plant Industry and the Idaho State Department of Agriculture, the Idaho State Land Board, the Idaho State Board of Forestry, the University of Idaho, the Clearwater Timber Protective Association, the Potlatch Timber Protective Association, the Coeur d'Alene Timber Protective Association the Pend Oreille Timber Protective Association, and the Priest Lake Timber Protective Association.

The general memorandum, effective July 1, 1931, and to remain in effect indefinitely, is shown in the 1931 annual report. Amendment No. 3 was, however, executed to the Agreement between the Bureau of Entomology and Plant Quarantine and the State Land Department of the State of Idaho to cover cooperative local control work on white pine lands owned by the State of Idaho. This amendment is as follows:

Amendment No. 3
Spokane, Wash.

AMENDMENT TO
MEMORANDUM OF UNDERSTANDING
Effective April 1, 1931
Between
THE UNITED STATES DEPARTMENT OF AGRICULTURE, BUREAU OF PLANT INDUSTRY
AND THE STATE LAND DEPARTMENT, STATE OF IDAHO

Cooperative Work in Controlling White Pine Blister Rust in Idaho

* * *

The undersigned mutually agree that the memorandum of understanding between the United States Department of Agriculture, Bureau of Plant Industry, and the State Land Department, State of Idaho, effective April 1, 1931, to continue in effect until March 31, 1932, shall be continued in full force and effect in all of its provisions by the United States Department of Agriculture, Bureau of Entomology and Plant Quarantine and the State Land Department, State of Idaho, for the period April 1, 1935 to March 31, 1936, with the exception of paragraphs B-5, C-1 and D, which shall be amended to read as follows:

B-5. For the period April 1, 1935 to March 31, 1936, the Federal Government in behalf of the United States Department of Agriculture, Bureau of Entomology and Plant Quarantine will expend in so far as practicable $15,000 in connection with the work herein provided for.

C-1. Expend about $15,000 upon this cooperative project for the period April 1, 1935 to March 31, 1936. This contribution to be paid into the Treasury of the United States, in such installments and at such times as the Bureau of Entomology and Plant Quarantine considers necessary for the proper prosecution of the work, and to be disbursed by the properly authorized officials of the Bureau of Entomology and Plant Quarantine.

D. For the period stated above, this cooperative control work shall be performed in Two Mouth Creek and Indian Creek drainages in T. 62 N., R. 3 and 4 W. T. 61 N., R. 4 and 3 W., in the vicinity of Coolin, Idaho.

The undersigned also mutually agree that this memorandum shall take effect April 1, 1935 and continue in effect until March 31, 1936, provided that either party may terminate the agreement at any time by a written statement to that effect 30 days in advance of the date of termination desired.

C. Ben Ross
President of the State Board of Land Commissioners.

W. E. Talboy
State Land Commissioner, State of Idaho.

Countersigned:

Lee A. Strong
Chief, Bureau of Entomology and Plant Quarantine, U. S. D. A.

Franklin Girard
Secretary of State

RIBES ERADICATION, INLAND EMPIRE, 1935

By
H. E. Swanson
Pathologist

INTRODUCTION

The Ribes eradication program in the Inland Empire during the 1935 field season included crews from 37 Civilian Conservation Corps camps, 14 camps operated on regular funds appropriated to the United States Forest Service for blister rust control, 2 state cooperative camps operated with funds from the State of Idaho and the Division of Plant Disease Control, 33 Emergency Relief Administration camps operated with funds allotted to the Division of Plant Disease Control under the Emergency Relief Act, and 13 Emergency Relief Administration camps operated with similar funds allotted to the United States Forest Service. In most cases Ribes eradication work was under way in ECW camps by the end of May. The state cooperative camps were started in the latter part of June. The regular Forest Service camps were started shortly after the first of July, at which time the funds were available. Appropriations under the Emergency Relief Act were not made available until late in July which was responsible for a very late start for the ERA camps. Forest Service funds under this appropriation were made available before those of the Division of Plant Disease Control. Forest Service ERA camps were started about the middle of July and those of the Division of Plant Disease Control were started on July 29 and camps were still being established until the latter part of August. On account of the late start of the ERA program camps were kept in the field as late as possible. Most of these camps were discontinued on October 15, which was somewhat late for effective work. Work in the ECW camps, the state cooperative camps and the regular Forest Service camps was for the most part discontinued by October 1.

The work was performed on lands of the Clearwater National Forest, the Clearwater Timber Protective Association, the St. Joe National Forest, the Potlatch Timber Protective Association, the Coeur d'Alene National Forest, the Kaniksu National Forest, the Priest Lake Timber Protective Association, the Kootenai National Forest and the Cabinet National Forest.

Detailed reports on Ribes eradication are presented by states as indicated below:

Montana:

1. Montana Operation (Kootenai and Cabinet National Forests).

Idaho:

1. Ribes Eradication - Clearwater Operation
2. Ribes Eradication - St. Joe Operation
3. Ribes Eradication - Coeur d'Alene Operation
4. Ribes Eradication - Kaniksu Operation

Note: The report on the Kaniksu Operation includes work done in Idaho and work on adjacent lands in Washington inside the Kaniksu National Forest boundary.

Washington:

1. Ribes Eradication - Mount Spokane Operation
2. Ribes Eradication - Mount Rainier National Park

Note: Summaries for the Inland Empire do not include the work performed on Mount Rainier National Park.

ORGANIZATION AND ADMINISTRATION

In general the cooperative relations between the Forest Service and the Division of Plant Disease Control were the same as in previous seasons, the former being responsible for such matters as transportation and the furnishing of supplies and equipment, the latter being responsible for the technical supervision of the field work. In regard to the CCC camps the responsibility of the Forest Service and the Division of Plant Disease Control lay chiefly in the selection of technical overhead for these camps and in the direction of the work in the field.

An ECW camp is normally made up of 200 enrollees. For a camp engaged entirely on blister rust control work the technical supervisory personnel included a camp superintendent, six technical foremen, one checker foreman and two checkers. This was one less technical foreman than was authorized in the 1934 season which represented a serious handicap in the proper supervision of CCC workers in the field. This handicap was obviated somewhat by many of the camps not having the full quota of enrollees. In camps engaged on other work projects besides blister rust control the number of foremen and checkers for blister rust work was reduced proportionately according to the number of enrollees assigned to this work. On account of the late start of the ERA program it was possible to use larger camps than are normally used when camps operate for a full four months' season. The ERA camps were built up on the basis of 66 men. In the ERA camps operated by the Division of Plant Disease Control the appointed personnel consisted of one camp boss, one checker, and one supervisory cook. The rest of the personnel came from the relief rolls. Three relief workers were paid at the skilled rate of $63 a month, one of these being an assistant camp boss, one a camp clerk, and one a second cook. The rest of the camp crew was made up of crew leaders and laborers, the former being paid at the intermediate rate of $50 per month and the latter $44 per month. One crew leader and two laborers constituted a field crew. All relief workers were subject to a 20 percent board deduction from their wages.

The Forest Service ERA camps operated under the same regulations in regard to wages and board as those operated by the Division of Plant Disease Control. However, in the case of the Forest Service camps more supervision was provided through the employment of an assistant camp boss.

The assignment of full time personnel of the Division of Plant Disease Control on Ribes eradication was as follows:

General Supervision - Inland Empire:
- H. E. Swanson - Project leader in charge of local control.

Clearwater Operation:
- B. A. Anderson - Operation supervisor.
- F. J. Heinrich - Assistant operation supervisor.
- E. J. Faulkner - Checking supervisor.

St. Joe Operation:
H. J. Hartman - Operation supervisor.
D. J. Moore - Assistant operation supervisor.
W. F. Painter - Checking supervisor.

Coeur d'Alene Operation:
W. G. Guernsey - Operation supervisor.
N. D. Nelson - Assistant operation supervisor.
A. L. Pence - Checking supervisor.
M. D. Oaks - Unit supervisor.

Kaniksu Operation:
F. O. Walters - Operation supervisor.
L. L. White - Assistant operation supervisor.
H. A. Brischle - Checking supervisor.

Montana Operation:
C. H. Johnson - Operation supervisor.
S. A. Skoglund - Checking supervisor.

Mount Spokane Operation:
M. C. Riley - Operation supervisor.
V. D. Moss - Assistant operation supervisor.

Note: While B. A. Anderson and W. G. Guernsey transferred to the United States Forest Service effective July 1, they continued to act in the capacity of operation supervisors on their respective operations through the balance of the field season, under agreement made between the Division of Plant Disease Control and the U. S. Forest Service.

The following represents a tabulation of the number of camps and the number of men engaged on Ribes eradication work in the Inland Empire during 1935:

Activity	Number of Camps	Number of Men
E. C. W.	37	4,141
B.Q. - E.R.A.	33	2,210
F.S. - E.R.A.	13	669
F.S. - Regular	14	414
State Cooperative	2	64
Total	99	7,498

METHODS AND EQUIPMENT

The methods employed on Ribes eradication were in general the same as those used in the 1934 field season, although certain changes were made to improve the work. First, considerable attention was given to the problem of uniform efficiency over the entire area worked from each camp. In doing this, areas 20 acres or more in size which did not meet the standards set up for effective work were reworked. The final result of this practice means that on all areas worked the average number of feet of live stem left per acre is applicable to the entire camp area and does not mean that parts of the area are practically free of Ribes and other small portions contain Ribes in amounts which would not give proper protection. Second, a new method for eradicating large Ribes or Ribes occurring in dense brush, under logs or in rock crevices which offer considerable resistance to

hand pulling methods, a method of cutting such bushes off at the crown and applying a small dosage of approximately two ounces of Borax was used for destroying such bushes. It was found that a considerable amount of time was saved and a more effective job of eradicating the Ribes was done by the use of this decapitation method. However, in light of the experience this season, it is believed that the usefulness of this method will be limited to those areas in which the type of Ribes referred to above occur in abundance.

CHECKING

The checking organization functioned as in the previous season. The methods employed were the same as used in 1934, with the exception that in the case of running advance strips the width of strip covered by a checker was increased to 30 feet. The reason for this change was to give assurance that any areas eliminated from crew work were free from Ribes. In this advance stripping the distribution and location of Ribes are of more importance than the actual amount present. The field plan used this year called for the advance stripping on a 2 percent sample check on all areas included in the work program. Those areas which the advance check showed to be relatively free from Ribes were given a further inspection which constituted a 4 percent check of the area. By the application of this plan areas containing Ribes were definitely located for crew work and needless searching by eradication crews on areas free of Ribes was eliminated.

PREERADICATION AND OTHER SURVEYS

Very little additional preeradication work was necessary at the close of the field season, since this work was largely completed in 1933 and 1934. Such preeradication as was performed is described in the individual operations reports.

Near the end of the season it was determined advisable to conduct a survey to determine the amount and description of infection on Ribes viscosissimum. While this survey was conducted late in the season after considerable defoliation had occurred on Ribes, the result served to indicate the extent and distribution of blister rust infection on R. viscosissimum. The following tabulation shows the results of this survey.

Operation	Inspection Points	Number Bushes Examined	Number Bushes Infected	Percent Bushes Infected	Average of Percentages of Infection at All Points
Clearwater	35	774	112	14.5	24.6
St. Joe	52	1,103	243	22.0	26.9
Coeur d'Alene	33	1,331	59	4.4	4.5
Kaniksu	19	1,384	112	8.9	7.3
Kootenai - Cabinet	22	710	0	0.0	0.0
Mount Spokane	23	2,265	193	8.5	10.3

In addition a survey was conducted to determine the amount of blister rust infection on white pine. The results of this survey are discussed in detail in a report by R. L. MacLeod. The general findings of this survey are shown in

the following data:

Operation	Number of White Pines Examined	Number of White Pines Infected	Percent Infected
Clearwater	1,677	31	1.85
St. Joe	8,350	345	4.13
Coeur d'Alene	5,658	37	.65
Kaniksu	5,479		
Kootenai - Cabinet	5,980	4	.07
Total	27,144	417	1.54

STATEMENT OF EXPENDITURES AND COSTS

The statement of expenditures and costs includes those funds expended from appropriations directly allotted to the Bureau of Entomology and Plant Quarantine, the United States Forest Service, and funds turned over to the Bureau of Entomology and Plant Quarantine by the State of Idaho for use in Ribes eradication on state lands. The direct appropriations to the Bureau of Entomology and Plant Quarantine and the United States Forest Service were those allotted under NIRA, the Emergency Relief Act, and the regular appropriations for blister rust control work.

No complete costs are available for ECW work except those incurred by the Bureau of Entomology and Plant Quarantine in the course of providing technical supervision to ECW work.

Effective man days in the following tabulations represent eight hours of work in the field by men actually engaged in the eradication of Ribes.

On account of the late season start of the ERA work and the maintenance of the camps in the field later than the normal operating season, the number of effective man days under this program for the 1935 season is considerably lower in relation to costs than it would be in the case of a full season of work. Consequently, the cost per effective man day is higher than it would be under normal conditions.

TABLE NO. 1

EXPENDITURES BY APPROPRIATIONS, CALENDAR YEAR 1935
INLAND EMPIRE

Cooperating Agency	Appropriation		Amount
	Impnira		$ 27,315.68
	Lieunira		178.70
	Regular		113,279.04
	ERA - Idaho		100,082.22
Forest Service	Total		241,355.64
	Nira	Idaho	41,757.34
	Nira	Washington	13,619.16
	Nira	Montana	12,783.99
	Regular	Idaho	9,375.49
	Regular	Washington	1,347.39
	Regular	Montana	1,[illegible].93
	ERA	Idaho	205,651.40
	ERA	Washington	66,319.40
Bureau of Entomology	ERA	Montana	53,743.46
and Plant Quarantine	Total		406,925.56
State of Idaho	State of Idaho		15,000.00
Total Expenditures	All Appropriations		$663,281.20

TABLE NO. 2

CLASSIFIED EXPENDITURES, CALENDAR YEAR 1935
INLAND EMPIRE

Item	Forest Service NIRA	Forest Service Regular	Forest Service ERA	Forest Service Total	Bureau of Entomology and Plant Quarantine NIRA	Bureau of Entomology and Plant Quarantine Regular	Bureau of Entomology and Plant Quarantine ERA	Bureau of Entomology and Plant Quarantine Total	State of Idaho	Total
Salaries, Permanent Men	$ 1,704.66	$ 5,455.85	$	$ 7,160.51	$19,064.89	$10,420.90	$ 10,172.47	$ 39,658.26	$	$ 46,818.77
Salaries, Temporary Men	3,306.16	2,011.50	4,305.30	9,622.96	4,705.56	408.93	34,205.05	39,319.54		48,942.50
Wages, Temporary Laborers	11,939.73	81,183.78	67,203.21	160,326.72	15,660.68	1,576.30	175,790.47	193,027.45	15,000.00	368,354.17
Subsistence Supplies	2,770.84	18,223.08	21,752.15	42,746.07	5,247.51	40.51	65,556.15	70,844.17		113,590.24
Equipment	4,846.91	2,744.25	2,355.79	9,946.95	1,545.96		15,505.55	17,051.51		26,998.46
Trucks	763.51			763.51			3,901.45	3,901.45		4,664.96
Travel and Transportation	621.23	1,084.50	2,987.35	4,693.08	4,299.13	550.10	9,410.82	14,260.05		18,953.13
Chemical							21.12	21.12		21.12
Twine					12,449.30			12,449.30		12,449.30
Other Supplies and Expenses	2,041.34	2,576.08	1,478.42	6,095.84	5,192.46	149.07	11,051.18	16,392.71		22,488.55
Total Expenditures	27,994.38	113,279.04	100,082.22	241,355.64	68,165.49	13,145.81	325,614.26	406,925.56	15,000.00	663,281.20
Less 2/3 Cost New Equipment	2,649.76	118.34	217.95	2,986.05	1,027.30		14,141.13	15,168.43		18,154.48
Less Cost Unused Supplies	59.86		1,555.06	1,614.92	11,500.00			11,500.00		13,114.92
Plus 1/3 Cost Old Equipment	1,732.00			1,732.00	13,200.76			13,200.76		14,932.76
Plus Cost Supplies on Hand	464.80		442.50	907.30						907.30
Plus 1934 Preeradication					902.74			902.74		902.74
Plus Bulldozer Depreciation	1,541.11	866.87		2,407.98						2,407.98
Net Cost 1935 Operation	$29,022.67	$114,027.57	$ 98,751.71	$241,801.95	$69,741.69	$13,145.81	$311,473.13	$394,360.63	$15,000.00	$651,162.58

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In arriving at effective 8-hour man day costs for the various classes of camps, it was difficult to prorate costs incurred by use of funds to finance training school, pre-season surveys, and other activities incidental to the starting of the field work. This particularly applies to the use made of FERA balances remaining from the 1934 operation. Where costs represented a direct charge to one class of camp they were charged accordingly, the remainder was prorated on the basis of the number of camps in each class.

The high effective man day costs in ERA work for those camps operated by the Bureau of Entomology and Plant Quarantine is a direct result of the short season of work and maintaining the camps in the field late in the fall when the weather made it possible to work on Ribes eradication only a small percentage of the time. In the case of the effective man day costs in the Forest Service ERA camps, Ribes eradication work comprised the chief activity, although there were other lines of work performed. Since the total cost of operating the camps is included in the Forest Service figures, the effective man day cost is not a true cost for blister rust work. The following tabulation represents the combined costs for all blister rust control operations in the Inland Empire.

Activity	Effective Man day Cost	Total Net Cost
EQ-ERA	$7.95	$350,105.69
FS-ERA	8.39	116,719.05
FS-Reg.	7.10	126,543.06
State Coop.	6.37	19,415.76
Contributed in cooperation with ECW		38,379.02
Total net cost of 1935 operation		$651,162.58

Average cost per meal............$.205
Pounds of Atlacide used..........109,930

SUMMARY OF RIBES ERADICATION, 1935
INLAND EMPIRE

TABLE NO. 3 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Effective Man Days	Total Ribes	Total Gallons Spray
Open Reproduction	65,169	967		102,122	30,630,483	
Dense Reproduction	15,937	418		5,257	877,827	
Open Pole	39,442	650		20,158	2,835,410	
Dense Pole	13,909	92		2,612	495,758	
Open Mature	80,868	6,223		43,645	7,675,076	
Dense Mature	10,187			725	76,685	
Cut Over	7,957	1,189		7,259	1,549,167	
Brush	6,191	113		5,608	657,182	
Burn	5,403			3,198	910,565	
Subalpine	683			174	44,707	
Meadow-Field	1,279			151	12,131	
All Upland	247,025	9,652		190,909	45,765,013	
Stream (Hand)	8,465	3,577	1,208	35,356	6,888,834	
Stream (Chemical)	960	176	42	4,159	329,790	109,930
Stream (Slash)	97	26		2,166	79,231	
Stream (Machine)	354			1,341	177,000	
All Stream	8,916	3,590	1,208	43,022	7,474,855	
All Types	255,941	13,242	1,208	233,931	53,239,868	

TABLE NO. 3A - FIRST WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis Man Days	Ribes	Gallons Spray
Open Reproduction	65,169	101,241	30,479,848		1.55	468	
Dense Reproduction	15,937	5,080	861,164		.32	54	
Open Pole	39,442	19,522	2,783,000		.49	71	
Dense Pole	13,909	2,583	494,657		.19	36	
Open Mature	80,868	41,946	7,538,466		.52	93	
Dense Mature	10,187	725	76,685		.07	8	
Cut Over	7,957	6,452	1,342,234		.81	169	
Brush	6,191	5,529	652,327		.89	105	
Burn	5,403	3,198	910,565		.59	169	
Subalpine	683	174	44,707		.25	65	
Meadow-Field	1,279	151	12,131		.12	9	
All Upland	247,025	186,601	45,195,784		.76	163	
Stream (Hand)	8,465	27,674	6,034,306		3.27	713	
Stream (Chemical)	960	3,788	304,611	101,537	3.95	317	106
Stream (Slash)	97	1,638	75,434		16.89	778	
Stream (Machine)	354	1,341	177,000		3.79	500	
All Stream	8,916	34,441	6,591,351		3.86	739	
All Types	255,941	221,042	51,787,135		.86	202	

TABLE NO. 3B - SECOND WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis Man Days	Ribes	Gallons Spray
Open Reproduction	967	881	150,635		.91	156	
Dense Reproduction	418	177	16,663		.42	40	
Open Pole	650	636	52,410		.98	81	
Dense Pole	92	29	1,101		.32	12	
Open Mature	6,223	1,699	136,612		.27	22	
Cut Over	1,189	807	206,953		.68	174	
Brush	113	79	4,855		.70	43	
All Upland	9,652	4,308	569,229		.45	59	
Stream (Hand)	3,577	6,485	671,406		1.81	188	
Stream (Chemical)	176	266	16,299	5,433	1.51	93	31
Stream (Slash)	26	528	3,797		20.19	146	
All Stream	3,590	7,279	691,502		2.03	193	
All Types	13,242	11,587	1,260,731		.86	95	

TABLE NO. 3C - THIRD WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis Man Days	Ribes	Gallons
Stream (Hand)	1,208	1,197	163,122		.99	151	
Stream (Chemical)	42	105	8,880	2,960	2.50	211	71
All Stream	1,208	1,302	192,002		1.08	159	

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TABLE NO. 4

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1935
INLAND EMPIRE

Working	Class	Acres	Effective Man Days	Total Ribes	Per Acre Man Days	Per Acre Ribes
First	EQ-ERA	66,065	43,054	8,457,819	.65	128
	FS-ERA	14,172	13,914	2,999,899	.98	212
	FS-Reg.	14,567	15,945	7,237,054	1.09	497
	State Coop.	16,768	3,048	593,078	.18	35
	F-ECW	95,916	113,868	27,590,774	1.19	288
	S&P-ECW	48,453	31,213	4,878,511	.64	101
Second	EQ-ERA	1,239	1,001	211,123	.81	170
	FS-Reg.	6,788	1,541	184,678	.23	27
	F-ECW	4,417	7,890	710,647	1.79	161
	S&P-ECW	798	1,155	154,283	1.45	193
Third	FS-Reg.	446	348	31,543	.78	71
	F-ECW	693	892	157,601	1.29	227
	S&P-ECW	69	62	2,858	.90	41
All Workings	EQ-ERA	67,304	44,055	8,698,942	.65	129
	FS-ERA	14,172	13,914	2,999,899	.98	212
	FS-Reg.	21,801	17,834	7,453,275	.82	342
	State Coop.	16,768	3,048	593,078	.18	35
	F-ECW	101,026	122,650	28,459,022	1.21	282
	S&P-ECW	49,320	32,430	5,035,652	.66	102

TABLE NO. 5

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1935
INLAND EMPIRE

Working	Number of Acres Worked By Ownership Classes: Federal	State: Idaho	State: Washington	Private	Total
First	126,793	30,150	1,216	97,782	255,941
Second	10,180	280		2,782	13,242
Third	1,018	71		119	1,208
All Workings	137,991	30,501	1,216	100,683	270,391

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TABLE NO. 6

TOTAL RIBES BY SPECIES ERADICATED, 1935
INLAND EMPIRE

Working	Eradication Type	Acres	Ribes by Species: Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	Ribes irriguum	Ribes acerifolium	Total Ribes
First	Open Reproduction	65,169	8,996,500	21,037,704	14,810	339,182	91,652		30,479,848
	Dense Reproduction	15,937	632,624	222,399	124	5,692	325		861,164
	Open Pole	39,442	1,408,465	1,284,550	597	31,940	53,600	3,848	2,783,000
	Dense Pole	13,909	330,634	153,077		7,650	3,296		494,657
	Open Mature	80,868	4,756,201	2,676,286	10,631	30,622	64,057	669	7,538,466
	Dense Mature	10,187	62,087	5,228		8,511	859		76,685
	Cut Over	7,957	537,211	788,401	1,183	9,012	6,427		1,342,234
	Brush	6,191	184,796	439,618		24,869	3,044		652,327
	Burn	5,403	334,636	548,615	7,419	14,471	5,424		910,565
	Subalpine	683	35,007	9,700					44,707
	Meadow-Field	1,279	5,010			7,121			12,131
	All Upland	247,025	17,283,171	27,165,578	34,764	479,070	228,684	4,517	45,195,784
	Stream	8,916	3,955,047	208,672	308,183	2,081,488	18,377	19,584	6,591,351
	All Types	255,941	21,238,218	27,374,250	342,947	2,560,558	247,061	24,101	51,787,135
Second	Open Reproduction	967	63,094	79,827	1,295	5,500	919		150,635
	Dense Reproduction	418	3,412	11,846	1,405				16,663
	Open Pole	650	22,338	26,752	3	3,296	21		52,410
	Dense Pole	92	698	118		285			1,101
	Open Mature	6,223	104,856	26,257	4,829	670			136,612
	Cut Over	1,189	78,542	125,761	2,630	20			206,953
	Brush	113	1,054	2,962		839			4,855
	All Upland	9,652	273,994	273,523	8,761	12,011	940		569,229
	Stream	3,590	387,897	5,055	64,939	233,536	75		691,502
	All Types	13,242	661,891	278,578	73,700	245,547	1,015		1,260,731
Third	Stream	1,208	85,008	248	48,626	58,120			192,002
All Workings	Open Reproduction	66,136	9,059,594	21,117,531	16,105	344,682	92,571		30,630,483
	Dense Reproduction	16,355	636,036	234,245	1,529	5,692	325		877,827
	Open Pole	40,092	1,430,803	1,311,302	600	35,236	53,621	3,848	2,835,410
	Dense Pole	14,001	331,332	153,195		7,935	3,296		495,758
	Open Mature	87,091	4,861,057	2,702,543	15,460	31,292	64,057	669	7,675,078
	Dense Mature	10,187	62,087	5,228		8,511	859		76,685
	Cut Over	9,146	615,753	914,162	3,813	9,032	6,427		1,549,187
	Brush	6,304	185,850	442,580		25,708	3,044		657,182
	Burn	5,403	334,636	548,615	7,419	14,471	5,424		910,565
	Subalpine	683	35,007	9,700		7,121			44,707
	Meadow-Field	1,279	5,010						12,131
	All Upland	256,667	17,557,165	27,439,101	43,525	491,081	229,624	4,517	45,765,013
	Stream	13,714	4,427,952	213,975	421,748	2,373,144	18,452	19,584	7,474,855
	All Types	270,391	21,985,117	27,653,076	465,273	2,864,225	248,076	24,101	53,239,868

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SUMMARY OF RIBES ERADICATION, 1923-1935
INLAND EMPIRE

TABLE NO. 7 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Effective Man Days	Total Ribes	Total Gallons Spray
Open Reproduction	306,552	4,930		344,584	101,273,273	
Dense Reproduction	77,357	1,960		33,899	5,019,888	
Open Pole	179,927	9,459		77,256	14,618,257	
Dense Pole	56,719	1,320		13,308	2,160,509	
Open Mature	474,415	14,082		222,705	49,330,019	
Dense Mature	56,008	542		7,131	976,818	
Cut Over	35,931	2,476		34,160	11,637,956	
Brush	21,176	547		20,817	4,036,063	
Burn	7,616			5,374	2,578,293	
Subalpine	1,736			1,079	295,651	
Meadow-Field	1,735			151	12,131	
All Upland	1,221,174	35,316		760,424	191,954,858	
Stream (Hand)	100,483	22,245	3,574	196,903	48,240,799	
Stream (Chemical)	18,767	4,665	119	45,995	3,734,005	1,214,030
Stream (Slash)	1,467	50	40	18,874	961,711	
Stream (Machine)	905			3,967	452,500	
All Stream	103,315	22,484	3,574	265,739	53,389,015	
All Types	1,324,489	57,800	3,574	1,026,163	245,343,873	

TABLE NO. 7A - FIRST WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis		
					Man Days	Ribes	Gallons
Open Reproduction	308,552	337,943	100,541,534		1.10	326	
Dense Reproduction	77,357	32,968	4,907,555		.43	63	
Open Pole	179,927	73,807	14,120,474		.41	78	
Dense Pole	56,719	13,008	2,154,499		.23	38	
Open Mature	474,415	216,666	48,206,564		.46	102	
Dense Mature	56,008	6,627	939,983		.12	17	
Cut Over	35,931	31,768	11,154,612		.68	310	
Brush	21,178	20,154	3,947,195		.95	186	
Burn	7,616	5,374	2,578,293		.70	339	
Subalpine	1,736	1,079	295,651		.62	170	
Meadow-Field	1,735	151	12,131		.09	7	
All Upland	1,221,174	739,705	186,858,491		.61	155	
Stream (Hand)	100,483	167,272	43,325,381		1.66	431	
Stream (Chemical)	16,767	40,417	3,391,498	1,099,831	2.15	181	59
Stream (Slash)	1,467	17,475	925,917		11.75	623	
Stream (Machine)	905	3,967	452,500		4.38	500	
All Stream	103,315	229,091	46,095,296		2.22	466	
All Types	1,324,489	968,796	236,953,787		.73	179	

TABLE NO. 7B - SECOND WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis		
					Man Days	Ribes	Gallons
Open Reproduction	4,930	6,641	731,739		1.35	148	
Dense Reproduction	1,960	931	112,333		.46	57	
Open Pole	9,459	3,449	497,783		.36	53	
Dense Pole	1,320	300	26,010		.23	20	
Open Mature	14,082	6,039	1,123,455		.43	80	
Dense Mature	542	304	36,835		.56	68	
Cut Over	2,476	2,392	479,344		.97	194	
Brush	547	663	88,868		1.21	162	
All Upland	35,316	20,719	3,096,367		.59	88	
Stream (Hand)	22,245	25,621	4,381,121		1.15	197	
Stream (Chemical)	4,665	5,328	324,495	108,195	1.14	70	23
Stream (Slash)	50	757	15,794		15.14	316	
All Stream	22,484	31,706	4,721,410		1.41	210	
All Types	57,800	52,425	7,817,777		.91	135	

TABLE NO. 7C - THIRD WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis		
					Man Days	Ribes	Gallons
Stream (Hand)	3,574	4,050	534,297		1.20	149	
Stream (Chemical)	119	250	18,012	6,004	2.10	151	50
Stream (Slash)	40	642	20,000		16.05	500	
All Stream	3,574	4,942	572,309		1.38	160	

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TABLE NO. 8

TOTAL RIBES BY SPECIES ERADICATED, 1923-1935
INLAND EMPIRE

Working	Eradication Type	Acres	Ribes by Species: Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	Ribes irriguum	Ribes triste	Ribes acerifolium	Total Ribes
First	Open Reproduction	308,552	27,206,068	71,956,468	147,491	970,132	260,230	1,145		100,541,534
	Dense Reproduction	77,357	2,561,985	2,231,831	15,720	70,821	27,198			4,907,555
	Open Pole	179,927	7,357,533	6,282,912	32,423	330,953	112,343	462	3,848	14,120,474
	Dense Pole	56,719	1,350,225	755,942	1,631	76,281	10,420			2,154,499
	Open Mature	474,415	32,350,180	15,224,811	98,878	329,745	202,281		669	48,206,564
	Dense Mature	56,008	701,993	191,665	1,104	42,382	2,839			939,983
	Cut Over	35,931	4,294,609	6,737,979	34,520	80,569	6,935			11,154,612
	Brush	21,178	1,353,869	2,467,229	19,233	97,116	9,748			3,947,195
	Burn	7,616	532,609	2,013,848	7,985	18,427	5,424			2,578,293
	Subalpine	1,736	217,172	78,460		19				295,651
	Meadow-Field	1,735	5,010			7,121				12,131
	All Upland	1,221,174	77,931,253	107,941,145	358,985	1,983,566	637,418	1,607	4,517	188,858,491
	Stream	103,315	31,083,351	1,533,238	4,985,863	10,381,914	74,540	16,806	19,584	48,095,296
	All Types	1,324,489	109,014,604	109,474,383	5,344,848	12,365,480	711,958	18,403	24,101	236,953,787
Second	Open Reproduction	4,930	361,397	351,442	1,295	16,647	958			731,739
	Dense Reproduction	1,960	92,551	18,249	4	1,529				112,333
	Open Pole	9,459	366,182	119,710	3	11,867	21			497,783
	Dense Pole	1,320	22,893	646		2,471				26,010
	Open Mature	14,082	660,862	444,529	4,860	11,798	1,406			1,123,455
	Dense Mature	542	36,053	732						36,835
	Cut Over	2,476	295,373	170,870	2,630	10,471				479,344
	Brush	547	9,531	78,498		839				88,868
	All Upland	35,316	1,844,842	1,184,726	8,792	55,622	2,385			3,096,367
	Stream	22,484	2,392,750	199,860	997,846	1,130,879	75			4,721,410
	All Types	57,800	4,237,592	1,384,586	1,006,638	1,186,501	2,460			7,817,777
Third	Stream	3,574	281,754	11,700	183,822	95,033				572,309
All Workings	Open Reproduction	313,482	27,567,465	72,307,910	148,786	986,779	261,188	1,145		101,273,273
	Dense Reproduction	79,317	2,654,536	2,250,080	15,724	72,350	27,198			5,019,888
	Open Pole	189,386	7,723,715	6,402,622	32,426	342,820	112,364	462	3,848	14,618,257
	Dense Pole	58,039	1,373,118	756,588	4,102	36,280	10,420			2,180,509
	Open Mature	488,497	33,011,042	15,669,340	103,738	341,543	203,687		669	49,330,019
	Dense Mature	56,550	738,046	192,447	1,104	42,382	2,839			976,818
	Cut Over	38,407	4,589,982	6,908,849	37,150	91,040	6,935			11,633,956
	Brush	21,725	1,363,400	2,545,727	19,233	97,955	9,748			4,036,063
	Burn	7,616	532,609	2,013,848	7,985	18,427	5,424			2,578,293
	Subalpine	1,736	217,172	78,460		19				295,651
	Meadow-Field	1,735	5,010			7,121				12,131
	All Upland	1,256,490	79,776,095	109,125,871	367,777	2,039,188	639,803	1,607	4,517	191,954,858
	Stream	129,373	33,757,855	1,744,798	6,167,531	11,607,826	74,615	16,806	19,584	53,389,015
	All Types	1,385,863	113,533,950	110,870,669	6,535,308	13,647,014	714,418	18,413	24,101	245,343,873

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TABLE NO. 9

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1923-1935
INLAND EMPIRE

Working	Number of Acres Worked By Ownership Classes					Total
	Federal	State			Private	
		Idaho	Montana	Washington		
First	746,016	168,151	435	2,996	406,891	1,324,489
Second	40,073	4,811			12,916	57,800
Third	2,832	171			571	3,574
All Workings	788,921	173,133	435	2,996	420,378	1,385,863

TABLE NO. 10

PROGRESS OF FIRST WORKING BY OWNERSHIP CLASSES, 1923-1935
INLAND EMPIRE

Ownership Class		Number of Acres		
		Worked	Unworked	Total
Federal		746,016	645,698	1,391,714
State	Idaho	168,151	194,927	363,078
	Montana	435		435
	Washington	2,996	3,260	6,256
Private		406,891	541,755	948,646
Total		1,324,489	1,385,640	2,710,129

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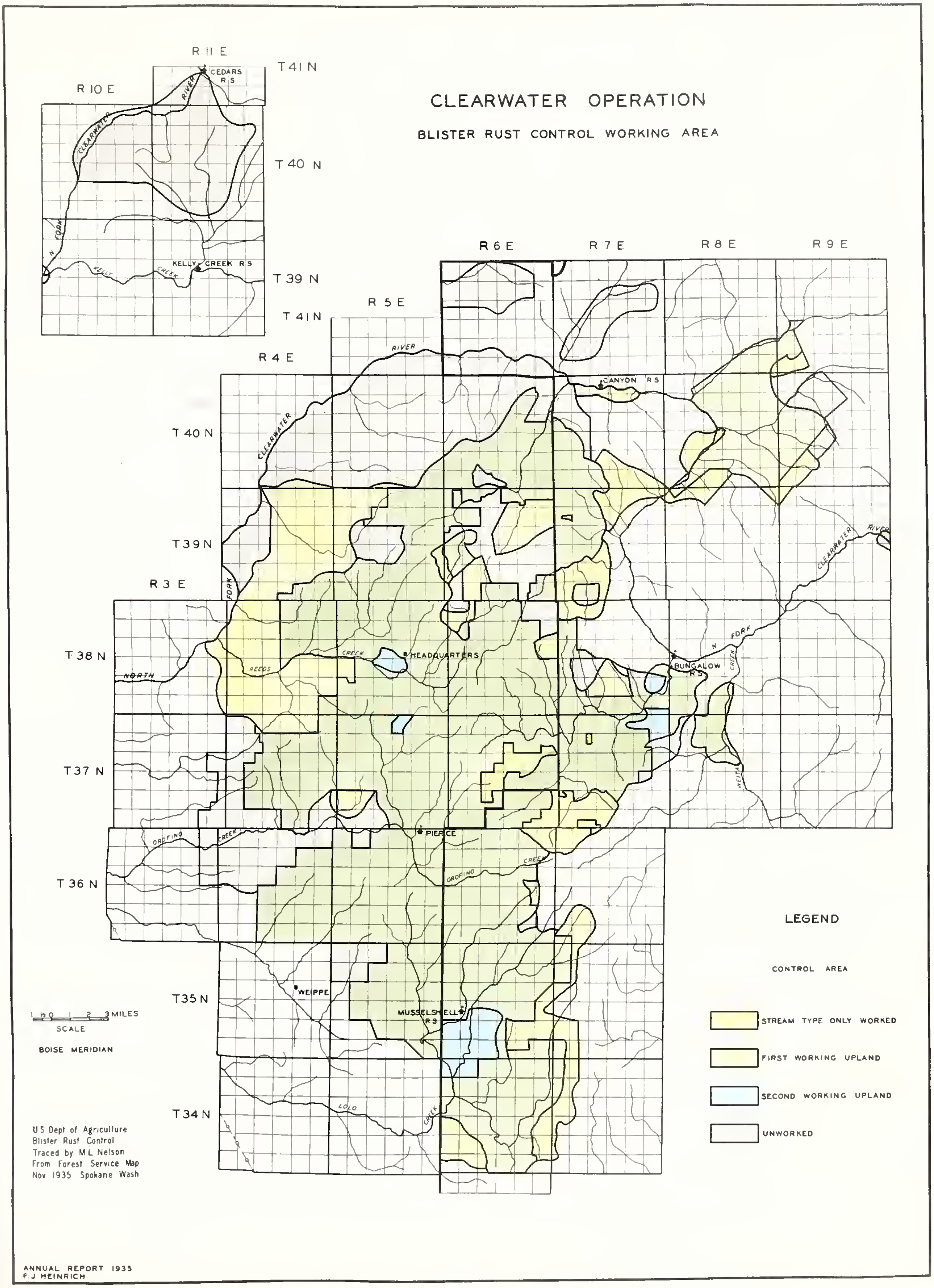

CLEARWATER OPERATION
BLISTER RUST CONTROL WORKING AREA
LEGEND
CONTROL AREA
STREAM TYPE ONLY WORKED
FIRST WORKING UPLAND
SECOND WORKING UPLAND
UNWORKED
R 11 E
R 10 E
T 41 N
T 40 N
T 39 N
CEDARS R S
KELLY CREEK R S
R 3 E
R 4 E
R 5 E
R 6 E
R 7 E
R 8 E
R 9 E
T 38 N
T 37 N
T 36 N
T 35 N
T 34 N
CANYON R S
HEADQUARTERS
BUNGALOW R S
PIERCE
WEIPPE
MUSSELSHELL R S
CLEARWATER
RIVER
NORTH FORK
REEDS CREEK
OROFINO CREEK
LOLO CREEK
WEITAS CREEK
1 ½ 0 1 2 3 MILES
SCALE
BOISE MERIDIAN
U S Dept of Agriculture
Blister Rust Control
Traced by M L Nelson
From Forest Service Map
Nov 1935 Spokane Wash
ANNUAL REPORT 1935
F J HEINRICH

RIBES ERADICATION, CLEARWATER OPERATION, 1935

By

F. J. Heinrich

Chief Scientific Aid

INTRODUCTION

At the beginning of the 1935 field season estimates for completion of all first working within the control area called for 82 30-man camps. Due to the curtailment of the program priority was given to completion of small blocks of unworked ground within the boundaries of worked area, eradication of *Ribes petiolare* and second working on certain important areas.

Adverse weather conditions retarded the start of the field season approximately one month later than that of 1934. Ribes eradication work began in ECW camps, May 31 and continued until October 1; in Forest Service regular camps, July 1 to September 20 and in ERA camps, August 7 to October 15.

The 1935 program consisted of five ECW camps, six regular 30-man camps financed by an allotment of $48,000 to the Clearwater National Forest from funds appropriated to the U. S. Forest Service in Region 1 for blister rust control, three camps financed by funds allotted to the U. S. Forest Service under the Emergency Relief Act and seven camps financed by funds allotted to the Bureau of Entomology and Plant Quarantine under the Emergency Relief Act. One unit supervisor for ECW camps on state and private lands was paid from funds appropriated by the State of Idaho for blister rust control work.

LOCATION AND DESCRIPTION OF AREAS

The Forest Service regular camps worked on Musselshell, Tamarack, Larch, Orogrande, Lolo, and Pine Creek drainages. The work on Orogrande, Pine and Lolo Creek areas represented second working. The work on Lolo Creek represented third working on stream type. On the Musselshell area, heavy concentrations of *Ribes viscosissimum* were encountered and numerous windfalls made working conditions very difficult.

The Forest Service ERA camps worked on Musselshell, Trout and Joy Creek drainages. These areas ran heavy to *R. viscosissimum* and the average number of Ribes per acre was 458.

Bureau of Entomology and Plant Quarantine ERA camps worked on Washington, Reeds, Quartz, Silver, Snake, Big and Elk Creek drainages. The work on Reeds and Quartz Creek areas represented second working on cut-over lands originally worked by ECW crews in 1933.

The ECW camps located on Hilderbrand, Breakfast, Washington, Schofield and Beaver Creeks worked entirely on first working. Heavy concentrations of *R. petiolare* were encountered on Washington and Schofield Creeks and their tributaries requiring a large amount of spraying work. The ECW camp located on Hilderbrand Creek worked on Orofino and Jim Ford Creek tributaries. This camp area was relatively free from Ribes. All stream type and approximately 60 percent of upland required working.

ORGANIZATION AND ADMINISTRATION

Blister rust control activities on the Clearwater project were organized and administered on the same cooperative basis as in former years. The technical aspects of the work were supervised by representatives of the Division of Plant Disease Control and operation matters including transportation and the supply of camps were primarily administered by a representative of the U.S. Forest Service. The office of the State Forester of Idaho maintained administrative control over state and private ECW camps.

Operation headquarters and the warehouse, as a central supply base, were located in Pierce, Idaho.

A change in administration of the regular Forest Service camps on the Clearwater National Forest was introduced this year. The district rangers were given responsibility for the financial control and the supplying of blister rust camps on their respective districts. This represented a change in the organization of the work from that used in former years under which the entire blister rust control program, on the forest, was administered as a special project irrespective of the districts on which the work was being done.

The ERA program was organized as a special project on the forest irrespective of ranger districts. This plan operated more satisfactorily and it is recommended that all blister rust work be centralized and administered as a special project under the plan used in former seasons in which the work is supervised jointly by a forest officer and a representative from the Division of Plant Disease Control.

B. A. Anderson, Operation Supervisor, Bureau of Entomology and Plant Quarantine, accepted a position with the U.S. Forest Service effective July 1, 1935. He continued to represent the Bureau as operation supervisor until October 15, 1935. At that time his duties were taken over by A. J. Heinrich.

J. N. Diehl, U.S. Forest Service, represented the Forest Service until July 10, 1935 at which time he was transferred to Region 9. His duties in connection with the blister rust program were taken over by J. P. Gaffney, Assistant Forester.

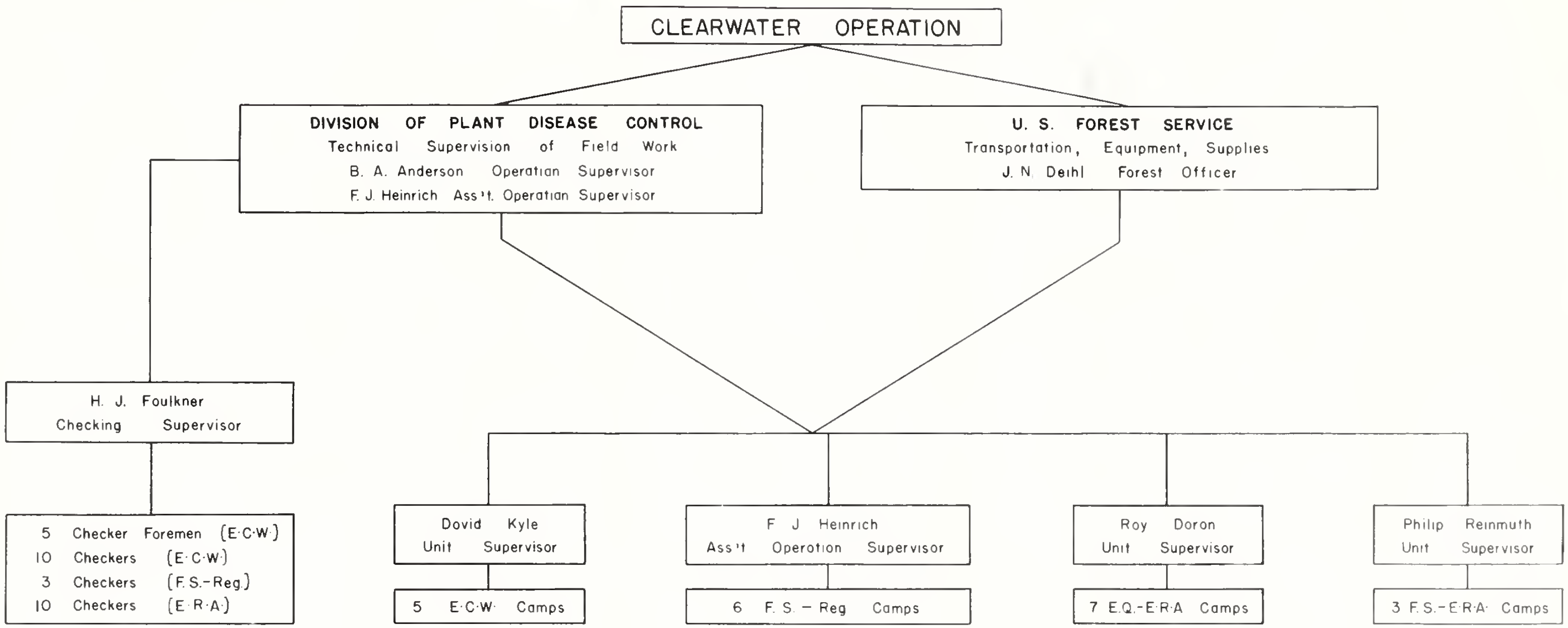
See Chart for complete field organization.

METHODS AND EQUIPMENT

A training school for the supervisory personnel was held June 3 to June 14. The school was held in conjunction with the U.S. Forest Service fire training school in order to economize on expenditures.

Due to the retarded season the unit supervisors were placed out on their respective units to check on proposed camp sites and working conditions on the area. Men trained for camp bosses and checkers were used to gather pre-check data on the areas to be given second working. Advance check was necessary in order to eliminate areas that did not need working.

ORGANIZATION CHART



E·C·W·
Number of Camps - 5
4 100 % Camps
1 90 % Camp
Number of Men on
Blister Rust Work - 914

FOREST SERVICE REGULAR
Number of Camps - 6
2 40 - man Camps
4 30 - man Camps
Number of Men on
Blister Rust Work - 200

E·R·A·
10 66 - man Camps
Number of Men on
Blister Rust Work - 628

Total Number of Men on Blister Rust Work — 1742

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The three-man crew was used almost entirely on hand Ribes eradication. The crew laid the string boundary as they covered the ground in all camps except ECW where crew strips were laid in advance on approximately 75% of the area. The practicability of each method depended on the working conditions and type of labor used.

The decapitation method was used on areas containing heavy concentrations of R. viscosissimum and windfalls. When large R. viscosissimum were found with root system under rocks and logs the stems were cut as near the crown as possible with a Pulaski and treated with a compound of borax and Atlacide. The method was used with varied success in the Forest Service regular camps on Musselshell Creek.

The four-man crew was used on chemical eradication. One pound of Atlacide was used per gallon of water. The crown application was carefully adhered to throughout the season.

Two regular Forest camps located on Musselshell Creek were supplied by pack strings. All other camps were located on roads and were supplied by trucks. In some cases, it was advantageous to transport men to and from work from these camps.

CHECKING

The primary purpose of the checking organization was to furnish immediate and detailed information on the amount and distribution of Ribes remaining on worked areas to insure an efficient job of eradication. At the beginning of the field season and later, when no worked areas were available for checking, checkers assisted the eradication forces in various ways. The most important were training men, supervising field work, making advance surveys of camp areas to provide necessary information for planning eradication work, and systematic surveys of areas worked previous to 1933 to determine the amount of second eradication necessary.

The parallel strip method was used for checking upland and major stream, and a meandering traverse for small upland streams. Parallel strips 13.2 feet in width were run in cardinal directions at 5-chain intervals on upland types and at $2\frac{1}{2}$-chain intervals on major streams.

This constituted a 4 percent check of upland types and 8 percent of major stream type. The same method was used for advance survey except that the interval between strips was increased to 10 chains and the width of strip to 30 feet. If this check revealed areas relatively free from Ribes, alternate strips were run to secure a higher percent check before any areas were eliminated from crew work.

A new method of applying the live stem standard of efficiency was adopted this year. After making a careful study of checking maps, checkers blocked out areas of 20 acres or more in size that did not meet the required standard of efficiency. Such areas were reported to the eradication forces for reworking which resulted in a more uniformly efficient job of eradication.

Checking costs based on the time spent on checking activities show the average per acre costs for ECW camps to be \$.144, for regular Forest Service camps \$.088 and for ERA camps \$.148. The average per acre cost for checking for all camps was \$.129.

PREERADICATION AND SURVEYS

Very little preeradication was necessary on the Clearwater project this season. At the close of the field season a trip was made into the Moose City Basin area, in order to get a general lay of the ground and a better knowledge of new roads and trails in so far as they would provide more desirable and accessible locations for camps.

A rapid and general survey was made late in the season to determine the amount of blister rust infection on R. viscosissimum. The results showed that blister rust infection on R. viscosissimum was generally distributed over the entire control area where Ribes eradication work had not been performed prior to the 1935 season. Approximately 15 percent of the bushes examined were infected.

Scouting for infection on white pine disclosed a heavy infection on the north fork of the Clearwater River four miles below Cedar Ranger Station.

Results of a pine disease survey conducted to determine the amount and distribution of blister rust infection on the Clearwater operation showed that out of 1,677 trees 3 to 15 feet in height examined, 31 or 1.85 percent were found to be infected.

STATEMENT OF EXPENDITURES AND COSTS

The statement of expenditures and costs includes those funds expended from appropriations directly allotted to the Bureau of Entomology and Plant Quarantine, the United States Forest Service, and funds turned over to the Bureau of Entomology and Plant Quarantine by the State of Idaho for use in Ribes eradication on state lands. The direct appropriations to the Bureau of Entomology and Plant Quarantine and the United States Forest Service were those allotted under NIRA, the Emergency Relief Act, and the regular appropriations for blister rust control work.

No complete costs are available for ECW work except those incurred by the Bureau of Entomology and Plant Quarantine in the course of providing technical supervision to ECW work.

Effective man days in the following tabulations represent eight hours of work in the field by men actually engaged in the eradication of Ribes.

On account of the late season start of the ERA work and the maintenance of the camps in the field later than the normal operating season, the number of effective man days under this program for the 1935 season is considerably lower in relation to costs than it would be in the case of a full season of work. Consequently, the cost per effective man day is higher than it would be under normal conditions.

TABLE NO. 1

EXPENDITURES BY APPROPRIATIONS, CALENDAR YEAR, 1935
CLEARWATER OPERATION

Cooperating Agency	Appropriation	Amount
	Impnira	$ 10,063.91
	Lieunira	17.24
	Regular	47,508.46
	ERA	25,155.46
Forest Service	Total	82,745.07
	NIRA	13,366.57
	Regular	2,527.32
Bureau of Entomology	ERA	61,408.61
and Plant Quarantine	Total	77,302.50
State of Idaho	State of Idaho	889.99
Total Expenditures	All Appropriations	$160,937.56

TABLE NO. 2

CLASSIFIED EXPENDITURES, CALENDAR YEAR, 1935
CLEARWATER OPERATION

Item	Forest Service				Bureau of Entomology and Plant Quarantine				State of Idaho	Total
	NIRA	Regular	ERA	Total	NIRA	Regular	ERA	Total		
Salaries, perm. men	$ 9.02	$ 1,791.62		$ 1,800.64	$ 4,332.31	$2,045.77	$ 1,839.43	$ 8,217.51		$ 10,018.15
Salaries, temp. men	1,709.54	1,201.10	$ 255.00	3,165.64	1,649.99	150.00	5,835.69	7,635.68		10,801.32
Wages, temp. laborers	3,716.38	33,544.03	16,171.95	53,432.36	4,678.81	154.12	33,381.05	38,213.98	$889.99	92,536.33
Subsistence supplies		9,151.82	7,172.05	16,323.87	34.31		10,496.05	10,530.36		26,854.23
Equipment	2,633.97	19.21	265.78	2,918.96	245.10		4,829.85	5,074.95		7,993.91
Trucks	270.46			270.46			656.53	656.53		926.99
Travel and trans.	49.12	962.09	611.45	1,622.66	1,229.14	122.84	1,756.78	3,108.76		4,731.42
Twine					75.00			75.00		75.00
Other supplies	1,692.66	838.59	679.23	3,210.48	1,121.91	54.59	2,613.23	3,789.73		7,000.21
Total	10,081.15	47,508.46	25,155.46	82,745.07	13,366.57	2,527.32	61,408.61	77,302.50	889.99	160,937.56
Less 2/3 cost of new equipment	877.99	6.40	83.59	972.98	163.40		3,853.09	4,016.49		4,989.47
Less cost of unused supplies			1,279.85	1,279.85						1,279.85
Plus 1/3 cost of old equipment					2,455.18			2,455.18		2,455.18
Plus cost of supplies on hand	464.80			464.80						464.80
Net cost of 1935 oper.	$ 9,667.96	$47,502.06	$23,787.02	$80,957.04	$15,658.35	$2,527.32	$57,555.52	$75,741.19	$889.99	$157,588.22

In arriving at effective 8-hour man-day costs for the various classes of camps, it is difficult to prorate costs incurred by use of funds to finance training schools, pre-season surveys, and other activities incidental to starting the field work. It should be born in mind that the high effective man-day costs for ERA work are a direct result of maintaining camps late in the fall when Ribes eradication work was only possible on a few days. In regard to the ERA work in Forest Service camps, other lines of work were performed from these camps although the full charge appears in these costs.

Activity	Effective Man Day Cost	Total Net Cost
EQ - ERA	$10.50	$ 66,507.64
FS - ERA	13.96	28,411.98
FS - Regular	7.84	54,960.34
Contributed in cooperation with ECW work		7,708.26
Total net cost of 1935 operation		$157,588.22

Additional information:

Average cost per meal $.191
Number of pounds of Atlacide used 77,809

SUMMARY OF RIBES ERADICATION 1935
CLEARWATER OPERATION

TABLE NO. 3

SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Effective Man Days	Total Ribes	Gallons Spray	Ribes Remaining Per Acre: Bushes	Live Stem
Open Reproduction	6,822	660		15,456	3,827,650		5.9	19.9
Dense Reproduction	355	233		137	46,016		.7	3.6
Open Pole	1,560	220		1,047	129,316		5.2	22.2
Dense Pole	187			40	5,415			
Open Mature	26,256	5,404		19,349	3,054,168		1.9	8.2
Dense Mature	241							
Cut Over	4,898	755		3,580	992,563		1.9	8.9
Brush	40	79		60	5,583		1.2	4.4
Burn	155			120	11,591		1.5	5.8
Meadow-Field	768						.2	1.6
All Upland	41,282	7,351		39,789	8,072,302		2.4	10.1
Stream (Hand)	346	24	446	1,487	335,106			
Stream (Chemical)	*821			2,966	233,427	77,809		
Stream (Slash)		13		25				
All Stream	346	24	446	4,478	568,533		3.6	20.0
All Types	41,628	7,375	446	44,267	8,640,835		2.6	11.6

*Hand work done in 1934. Chemical work done in 1935.

TABLE NO. 3A

FIRST WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis: Man Days	Ribes	Gallons Spray	Ribes Remaining Per Acre: Bushes	Live Stem
Open Reproduction	6,822	14,976	3,725,799		2.20	546		6.4	22.0
Dense Reproduction	355	110	44,817		.31	126		1.0	5.5
Open Pole	1,560	1,006	125,790		.64	81		5.9	25.9
Dense Pole	187	40	5,415		.21	29			
Open Mature	26,256	18,616	3,004,661		.71	114		2.0	8.6
Dense Mature	241								
Cut Over	4,898	3,066	840,358		.63	172		1.2	7.8
Brush	40	18	2,197		.45	55			
Burn	155	120	11,591		.77	75		1.5	5.8
Meadow-Field	768							.2	1.6
All Upland	41,282	37,952	7,760,628		.92	188		2.6	10.8
Stream (Hand)	346	1,099	296,987		3.18	858			
Stream (Chemical)	821	2,966	233,427	77,809	3.61	284	95		
All Stream	346	4,065	530,414		11.75	1,533		3.8	21.2
All Types	41,628	42,017	8,291,042		1.01	199		2.8	12.6

TABLE NO. 3B

SECOND WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Per Acre Basis: Man Days	Ribes	Ribes Remaining Per Acre: Bushes	Live Stem
Open Reproduction	660	480	101,851	.73	154	3.8	10.3
Dense Reproduction	233	27	1,199	.12	5	.2	1.0
Open Pole	220	41	3,526	.19	16	1.4	3.7
Open Mature	5,404	733	49,507	.14	9	.9	5.8
Cut Over	755	514	152,205	.68	202	9.5	21.5
Brush	79	42	3,386	.53	43	2.0	7.3
All Upland	7,351	1,837	311,674	.25	42	1.6	6.8
Stream (Hand)	24	40	6,576	1.67	274	1.4	5.4
Stream (Slash)	13	25		1.92			
All Stream	24	65	6,576	2.71	274	1.4	5.4
All Types	7,375	1,902	318,250	.26	43	1.6	6.7

TABLE NO. 3C

THIRD WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Per Acre Basis: Man Days	Ribes	Ribes Remaining Per Acre: Bushes	Live Stem
Stream (Hand)	446	348	31,543	.78	71	2.1	7.6

TABLE NO. 4

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1935
CLEARWATER OPERATION

Working	Class	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis: Man Days	Per Acre Basis: Ribes	Per Acre Basis: Gallons Per Sprayed Area	Ribes Remaining Per Acre: Bushes	Ribes Remaining Per Acre: Live Stem
First	EQ-ERA	4,841	5,819	1,361,082		1.20	281		6.5	17.6
	FS-ERA	1,220	2,035	558,423		1.67	458		6.0	27.8
	FS-Reg.	3,359	5,272	1,848,700	5,120	1.57	550	67	4.1	18.9
	F-ECW	2,759	4,587	982,656	690	1.66	356	17	3.1	20.0
	S&P-ECW	29,449	24,304	3,540,181	71,999	.83	120	102	2.2	10.5
Second	EQ-ERA	766	513	153,022		.67	200		5.6	14.4
	F-Reg.	6,609	1,389	165,228		.21	25		1.1	5.8
Third	F-Reg.	446	348	31,543		.78	71		2.1	7.6
All Workings	EQ-ERA	5,607	6,332	1,514,104		1.11	270		6.4	19.1
	FS-ERA	1,220	2,035	558,423		1.67	458		6.0	27.8
	FS-Reg.	10,414	7,009	2,045,471	5,120	.67	196	67	2.5	10.0
	F-ECW	2,759	4,587	982,656	690	1.66	356	17	3.1	20.0
	S&P-ECW	29,449	24,304	3,540,181	71,999	.83	120	102	2.2	10.5

TABLE NO. 5

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1935
CLEARWATER OPERATION

Working	Number of Acres Worked by Ownership Classes: Federal	State - Idaho	Private	Total Acres
First	6,711	10,151	24,766	41,628
Second	7,295		80	7,375
Third	446			446
All Workings	14,452	10,151	24,846	49,449

TABLE NO. 6

RESULTS OF CHECKING ON AREAS WORKED, 1935
CLEARWATER OPERATION

	Average Results For All Areas		Ribes Per Acre								Areas With More Than 25 Feet Live Stem Per Acre		
			Ribes lacustre		Ribes viscosissimum		Ribes petiolare		All Species			Per Acre	
Eradication Type	Acres in Checked Area	Acres Checked	Bushes	Live Stem	Bushes	Live Stem	Bushes	Live Stem	Bushes	Live Stem	Acres	Bushes	Live Stem
Open Reproduction	6,166	247	3.8	10.4	2.0	9.3	.1	.2	5.9	19.9	1,273	15	58
Dense Reproduction	588	24	.1	.3	.6	3.3			.7	3.6			
Open Pole	1,688	68	1.4	7.6	3.8	14.6			5.2	22.2	480	10	62
Dense Pole	79	3											
Open Mature	30,948	1,245	1.3	5.5	.5	2.6	.1	.1	1.9	8.2	877	16	59
Dense Mature	241	11											
Cut Over	4,572	177	.7	4.0	1.2	4.9			1.9	8.9	240	18	42
Brush	119	5			1.2	4.4			1.2	4.4			
Burn	155	6	1.3	5.3	.2	.5			1.5	5.8			
Meadow-Field	798	32	.2	1.6					.2	1.6			
All Upland	45,354	1,818	1.6	5.9	.8	4.1	.1	.1	2.5	10.1	2,870	15	57
Stream	1,336	356	2.1	9.1	.6	4.9	.9	6.0	3.6	20.0	52	21	118
All Types	46,690	2,174	1.7	6.4	.8	4.2	.1	1.0	2.6	11.6	2,922	16	64

TABLE NO. 7

TOTAL RIBES BY SPECIES ERADICATED, 1935
CLEARWATER OPERATION

Working	Eradication Type	Acres	Ribes by Species: Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	Total Ribes
First	Open Reproduction	6,822	1,553,140	2,161,635	11,024		3,725,799
	Dense Reproduction	355	13,809	30,884	124		44,817
	Open Pole	1,560	79,602	45,591	597		125,790
	Dense Pole	187		5,415			5,415
	Open Mature	26,256	2,382,515	611,715	10,431		3,004,661
	Dense Mature	241					
	Cut Over	4,898	180,707	659,625	26		840,358
	Brush	40	7	2,190			2,197
	Burn	155	8,565	3,026			11,591
	Meadow-Field	768					
	All Upland	41,282	4,218,345	3,520,081	22,202		7,760,628
	Stream (Hand)	346	273,415	11,837	1,308	10,427	296,987
	Stream (Chemical)	821			233,427		233,427
	All Stream	346	273,415	11,837	234,735	10,427	530,414
	All Types	41,628	4,491,760	3,531,918	256,937	10,427	8,291,042
Second	Open Reproduction	660	40,585	59,971	1,295		101,851
	Dense Reproduction	233	63	1,132	4		1,199
	Open Pole	220	159	3,364	3		3,526
	Open Mature	5,404	25,050	19,628	4,829		49,507
	Cut Over	755	42,228	107,347	2,630		152,205
	Brush	79	424	2,962			3,386
	All Upland	7,351	108,509	194,404	8,761		311,674
	Stream (Hand)	24	5,694	71	811		6,576
	Stream (Slash)	13					
	All Stream	24	5,694	71	811		6,576
	All Types	7,375	114,203	194,475	9,572		318,250
Third	Stream (Hand)	446	19,363	203	11,941	36	31,543
	All Stream	446	19,363	203	11,941	36	31,543
	All Types	446	19,363	203	11,941	36	31,543
All Workings	Open Reproduction	7,482	1,593,725	2,221,606	12,319		3,827,650
	Dense Reproduction	588	13,872	32,016	128		46,016
	Open Pole	1,780	79,761	48,955	600		129,316
	Dense Pole	187		5,415			5,415
	Open Mature	31,660	2,407,565	631,343	15,260		3,054,168
	Dense Mature	241					
	Cut Over	5,653	222,935	766,972	2,656		992,563
	Brush	119	431	5,152			5,583
	Burn	155	8,565	3,026			11,591
	Meadow-Field	768					
	All Upland	48,633	4,326,854	3,714,485	30,963		8,072,302
	Stream (Hand)	816	298,472	12,111	14,060	10,463	335,106
	Stream (Chemical)	821			233,427		233,427
	Stream (Slash)	13					
	All Stream	816	298,472	12,111	247,487	10,463	568,533
	All Types	49,449	4,625,326	3,726,596	278,450	10,463	8,640,835

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SUMMARY OF RIBES ERADICATION, 1929-1935

CLEARWATER OPERATION

TABLE NO. 8 SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Effective Man Days	Total Ribes	Gallons Spray
Open Reproduction	44,273	660		69,812	23,309,952	
Dense Reproduction	9,840	233		4,694	1,042,369	
Open Pole	18,282	220		10,992	2,732,464	
Dense Pole	3,209			818	174,863	
Open Mature	177,539	6,224		76,378	18,195,944	
Dense Mature	5,309			493	130,871	
Cut Over	21,752	755		21,070	7,921,046	
Brush	2,046	79		1,608	414,576	
Burn	464			675	683,018	
Subalpine	122			118	53,948	
Meadow-Field	1,224					
All Upland	284,060	8,171		186,658	54,659,051	
Stream (Hand)	40,146	12,334	1,657	50,192	12,191,108	
Stream (Chemical)	13,078	3,255	63	28,665	2,156,873	718,991
Stream (Slash)	65	13		1,258	188,983	
All Stream	40,651	12,536	1,657	80,115	14,536,964	
All Types	324,711	20,707	1,657	266,773	69,196,015	

TABLE NO. 8A - FIRST WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis		
					Man Days	Ribes	Gallons Spray
Open Reproduction	44,273	69,332	23,208,101		1.57	524	
Dense Reproduction	9,840	4,667	1,041,170		.47	106	
Open Pole	18,282	10,951	2,728,938		.60	149	
Dense Pole	3,209	818	174,863		.25	54	
Open Mature	177,539	75,075	17,969,703		.42	101	
Dense Mature	5,309	493	130,871		.09	25	
Cut Over	21,752	20,556	7,768,841		.94	357	
Brush	2,046	1,566	411,190		.77	201	
Burn	464	675	683,018		1.45	1,472	
Subalpine	122	118	53,948		.97	442	
Meadow-Field	1,224						
All Upland	284,060	184,251	54,170,643		.65	191	
Stream (Hand)	40,146	41,835	10,649,711		1.04	265	
Stream (Chemical)	13,078	25,670	2,020,134	673,378	1.96	154	51
Stream (Slash)	65	1,233	188,983		.19	2,907	
All Stream	40,651	68,738	12,858,828		1.69	316	
All Types	324,711	252,989	67,029,471		.78	206	

TABLE NO. 8B - SECOND WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis		
					Man Days	Ribes	Gallons Spray
Open Reproduction	660	480	101,851		.73	154	
Dense Reproduction	233	27	1,199		.16	51	
Open Pole	220	41	3,526		.19	16	
Open Mature	6,224	1,303	226,241		.21	36	
Cut Over	755	514	152,205		.68	202	
Brush	79	42	3,366		.53	43	
All Upland	8,171	2,407	488,408		.29	60	
Stream (Hand)	12,334	7,276	1,373,473		.59	111	
Stream (Chemical)	3,255	2,881	130,973	43,691	.89	40	13
Stream (Slash)	13	25			1.92		
All Stream	12,536	10,182	1,504,446		.81	120	
All Types	20,707	12,589	1,992,854		.61	96	

TABLE NO. 8C - THIRD WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis		
					Man Days	Ribes	Gallons Spray
Stream (Hand)	1,657	1,081	167,924		.65	101	
Stream (Chemical)	63	114	5,766	1,922	1.81	92	31
All Stream	1,657	1,195	173,690	1,922	.72	105	12
All Types	1,657	1,195	173,690	1,922	.72	105	

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TABLE NO. 9

TOTAL RIBES BY SPECIES ERADICATED, 1929-1935
CLEARWATER OPERATION

Working	Eradication Type	Acres	Ribes by Species: Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	Ribes irriguum	Ribes triste	Total Ribes
First	Open Reproduction	44,273	4,765,704	18,283,256	54,979	41,068	63,094		23,208,101
	Dense Reproduction	9,840	151,273	870,124	2,457	5,726	11,590		1,041,170
	Open Pole	18,282	1,816,091	899,566	12,813	6		462	2,728,938
	Dense Pole	3,209	126,930	47,637	296				174,863
	Open Mature	177,539	12,308,608	5,441,046	80,799	106,922	32,328		17,969,703
	Dense Mature	5,309	104,873	22,438	715	865	1,980		130,871
	Cut Over	21,752	1,967,516	5,749,802	29,251	21,764	508		7,768,841
	Brush	2,046	197,851	195,979	17,246	114			411,190
	Burn	464	14,966	668,052					683,018
	Subalpine	122	53,500	448					53,948
	Meadow-Field	1,224							
	All Upland	284,060	21,507,312	32,178,348	198,556	176,465	109,500	462	54,170,643
	Stream (Hand)	40,146	9,437,617	315,753	378,097	496,156	22,088		10,649,711
	Stream (Chemical)	13,078			2,020,134				2,020,134
	Stream (Slash)	65	36			188,947			188,983
	All Stream	40,651	9,437,653	315,753	2,398,231	685,103	22,088		12,858,828
	All Types	324,711	30,944,965	32,494,101	2,596,787	861,568	131,588	462	67,029,471
Second	Open Reproduction	660	40,585	59,971	1,295				101,851
	Dense Reproduction	233	63	1,132	4				1,199
	Open Pole	220	159	3,364	3				3,526
	Open Mature	6,224	53,612	167,800	4,829				226,241
	Cut Over	755	42,228	107,347	2,630				152,205
	Brush	79	424	2,962					3,386
	All Upland	8,171	137,071	342,576	8,761				488,408
	Stream (Hand)	12,334	882,434	109,847	315,842	65,350			1,373,473
	Stream (Chemical)	3,255			130,973				130,973
	Stream (Slash)	13							
	All Stream	12,536	882,434	109,847	446,815	65,350			1,504,446
	All Types	20,707	1,019,505	452,423	455,576	65,350			1,992,854
Third	Stream (Hand)	1,657	134,708	218	26,612	6,386			167,924
	Stream (Chemical)	63			5,766				5,766
	All Stream	1,657	134,708	218	32,378	6,386			173,690
	All Types	1,657	134,708	218	32,378	6,386			173,690
All Workings	Open Reproduction	44,933	4,806,289	18,343,227	56,274	41,068	63,094		23,309,952
	Dense Reproduction	10,073	151,336	871,256	2,461	5,726	11,590		1,042,369
	Open Pole	18,502	1,816,250	902,930	12,816	6		462	2,732,464
	Dense Pole	3,209	126,930	47,637	296				174,863
	Open Mature	183,763	12,362,220	5,608,846	85,628	106,922	32,328		18,195,944
	Dense Mature	5,309	104,873	22,438	715	865	1,980		130,871
	Cut Over	22,507	2,009,744	5,857,149	31,881	21,764	508		7,921,046
	Brush	2,125	198,275	198,941	17,246	114			414,576
	Burn	464	14,966	668,052					683,018
	Subalpine	122	53,500	448					53,948
	Meadow-Field	1,224							
	All Upland	292,231	21,644,383	32,520,924	207,317	176,465	109,500	462	54,659,051
	Stream (Hand)	54,137	10,454,759	425,818	720,551	567,892	22,088		12,191,108
	Stream (Chemical)	16,396			2,156,873				2,156,873
	Stream (Slash)	78	36			188,947			188,983
	All Stream	54,844	10,454,795	425,818	2,877,424	756,839	22,088		14,536,964
	All Types	347,075	32,099,178	32,946,742	3,084,741	933,304	131,588	462	69,196,015

TABLE NO. 10

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1929-1935
CLEARWATER OPERATION

Working	Number of Acres Worked by Ownership Classes: Federal	State - Idaho	Private	Total Acres
First	138,281	58,269	128,161	324,711
Second	12,690	3,389	4,628	20,707
Third	1,431	100	126	1,657
All Workings	152,402	61,758	132,915	347,075

TABLE NO. 11

PROGRESS OF FIRST WORKING BY OWNERSHIP CLASSES, 1929-1935
CLEARWATER OPERATION

Ownership Class	Number of Acres: Worked	Unworked	Total
Federal	138,281	62,937	201,218
State - Idaho	58,269	39,332	97,601
Private	128,161	93,317	221,478
Total	324,711	195,586	520,297

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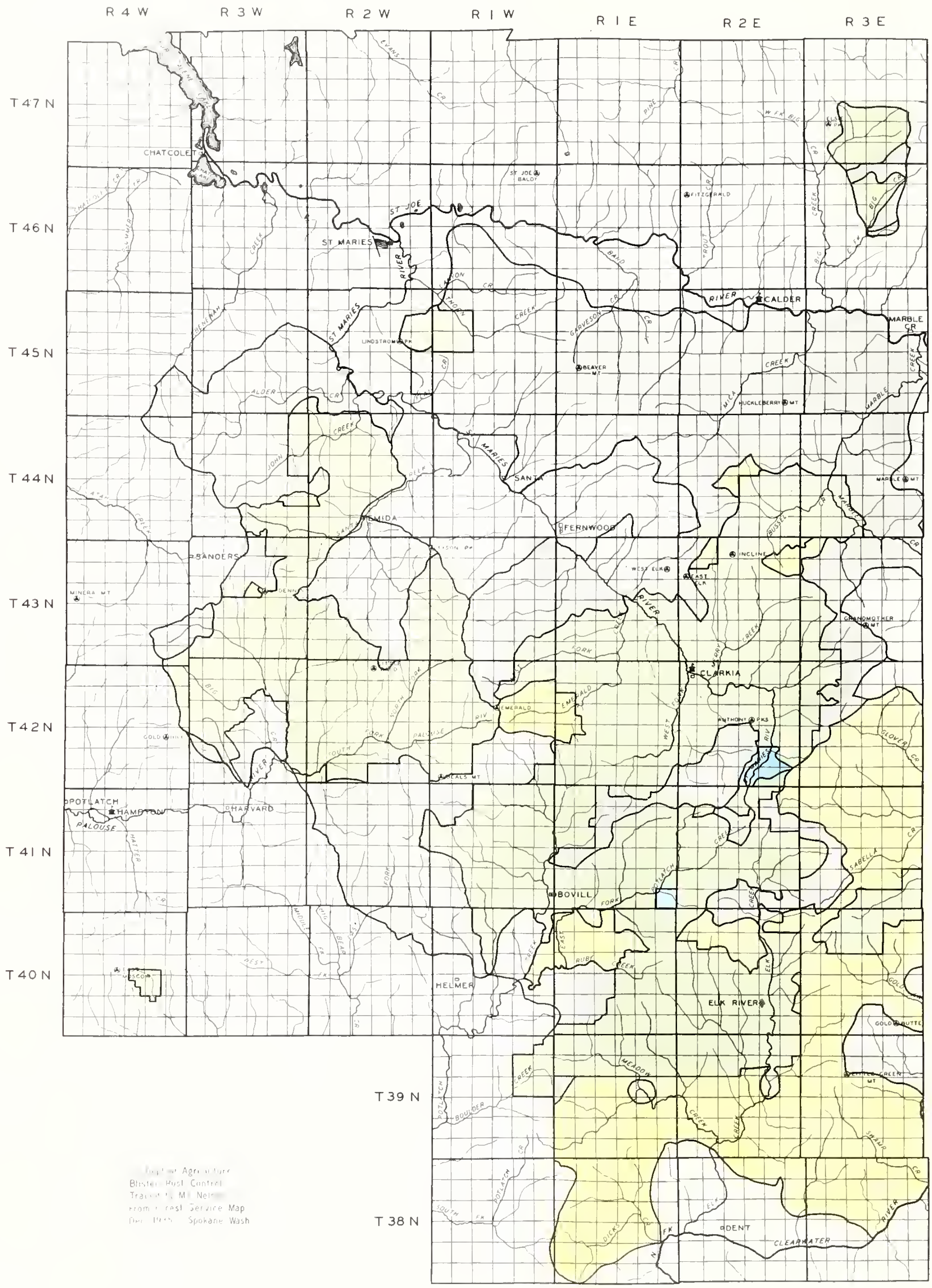
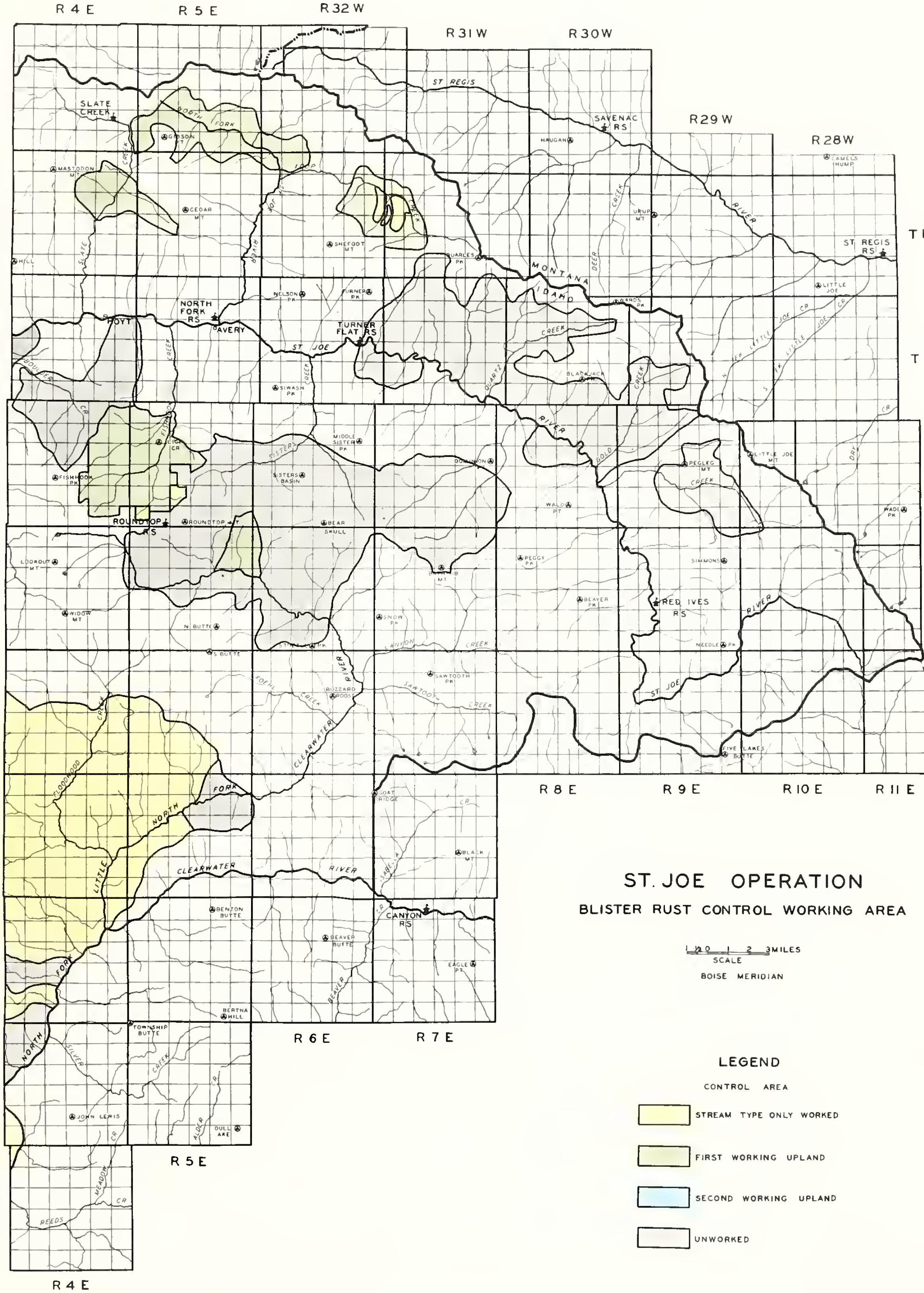


Agriculture
Blister Rust Control
Traced by M. Nelson
from Forest Service Map
Spokane Wash

ANNUAL REPORT 1935
TMAN


ST. JOE OPERATION
BLISTER RUST CONTROL WORKING AREA
SCALE
BOISE MERIDIAN
LEGEND
CONTROL AREA
STREAM TYPE ONLY WORKED
FIRST WORKING UPLAND
SECOND WORKING UPLAND
UNWORKED
R 4 E
R 5 E
R 32 W
R 31 W
R 30 W
R 29 W
R 28 W
R 6 E
R 7 E
R 8 E
R 9 E
R 10 E
R 11 E
T 47 N
T 46 N
T 45 N
T 44 N
T 43 N
T 42 N
T 41 N
T 40 N
T 39 N
T 38 N
T 18 N
T 17 N
T 16 N
T 15 N
MONTANA
IDAHO
ST REGIS
SAVENAC RS
ST REGIS RS
SLATE CREEK
NORTH FORK RS
AVERY
HOYT
TURNER FLAT RS
ST JOE
ROUNDTOP RS
RED IVES RS
CANYON RS
CLEARWATER RIVER
NORTH FORK
LITTLE NORTH FORK

RIBES ERADICATION, ST. JOE OPERATION, 1935

by

H. J. Hartman

Associate Forester

INTRODUCTION

The infection of western white pine on the St. Joe operation has now reached alarming proportions. That the infection of pine on this operation is extremely heavy and that damage will be done by the rust at a very rapid rate during the next few years was shown by a pine disease survey conducted on the St. Joe operation late in the fall of 1935. This survey revealed the fact that four out of every one hundred trees, fifteen feet and under in height, are now infected with white pine blister rust. Pine infection was found to be quite generally distributed as well as intense. Heavy infection on stream and upland species of Ribes has been found on unworked areas throughout the operation. The rust situation is very acute, and the amount of initial Ribes eradication work that is done within the next three years will, for a large part, determine the ultimate limits of our control areas.

The 1935 blister rust control program included seven ECW camps, six 30-man regular Forest Service camps, five 60-man ERA camps financed by the Division of Plant Disease Control and one 30-man ERA camp financed by the Forest Service. Ribes eradication work started in ECW camps on June 1; in Forest Service regular camps on July 1. ERA camps were established in early August. As a result of favorable weather most camps were operated until the early part of October.

The gross acreage in the white pine control area on the St. Joe operation is 985,035 acres; of this 343,288 acres have been given initial Ribes eradication.

LOCATION AND DESCRIPTION OF AREAS

The areas selected for control work were chosen in accordance with a general policy established by this Division and its cooperators. First attention was given to high-value white pine areas in the optimum range of the species, with due consideration being afforded the amount of infection present. Attention was given, also, to the amount of federal, state and private lands within the control units. In regard to this, working boundaries were so delineated that the proportion of lands treated was governed roughly by the available funds of each cooperator. Furthermore, since it is essential, for effective control, to treat completely a parcel of land regardless of its ownership, all plans were drawn up with the intent of keeping the entire worked area of the operation in a solid unit.

The work was centered around the Elk Creek and St. Maries River drainages. The major portion of the area worked had been burned over or logged and burned within the last fifty years. In the majority of cases Ribes lacustre and R. viscosissimum occurred in great abundance. The John Creek drainage supported several areas with heavy concentrations of R. inerme in close association with dense brush which were slashed and burned. Many heavy concentrations of R. petiolare existed on the Elk Creek and East Fork of Emerald Creek drainages.

ORGANIZATION AND ADMINISTRATION

A forest officer of the St. Joe National Forest and a member of the

RIBES ERADICATION, ST. JOE OPERATION, 1935

by

T. J. Hartman

Associate Forester

INTRODUCTION

The infection of western white pine on the St. Joe National Forest has reached alarming proportions. That the infection of pine on this [illegible] extremely heavy and that damage will be done by the rust at a most rapid rate [illegible] the next few years was shown by a pine disease survey conducted on the St. Joe operation late in the fall of 1935. This survey revealed the fact [illegible] of every one hundred trees, fifteen feet and under in height, [illegible] white pine blister rust. Pine infection was found to be quite general in distribution as well as intense. Heavy infection on streams and upland areas [illegible] found on unworked areas throughout the operation. The rust situation [illegible] and the amount of initial Ribes eradication work that is done [illegible] years will, for a large part, determine the ultimate limits of our control [illegible]

The 1935 blister rust control program [illegible] man regular Forest Service camps, five 50-man ECW camps [illegible] Plant Disease Control and one 30-man [illegible] eradication work started in ECW camps on June 1; in [illegible] July 1. ERA camps were established in early August. [illegible] weather most camps were operated until the early part of December.

The gross acreage in the white pine control area [illegible] is 935,365 acres; of this 343,285 acres have been given initial [illegible]

LOCATION AND DESCRIPTION OF AREAS

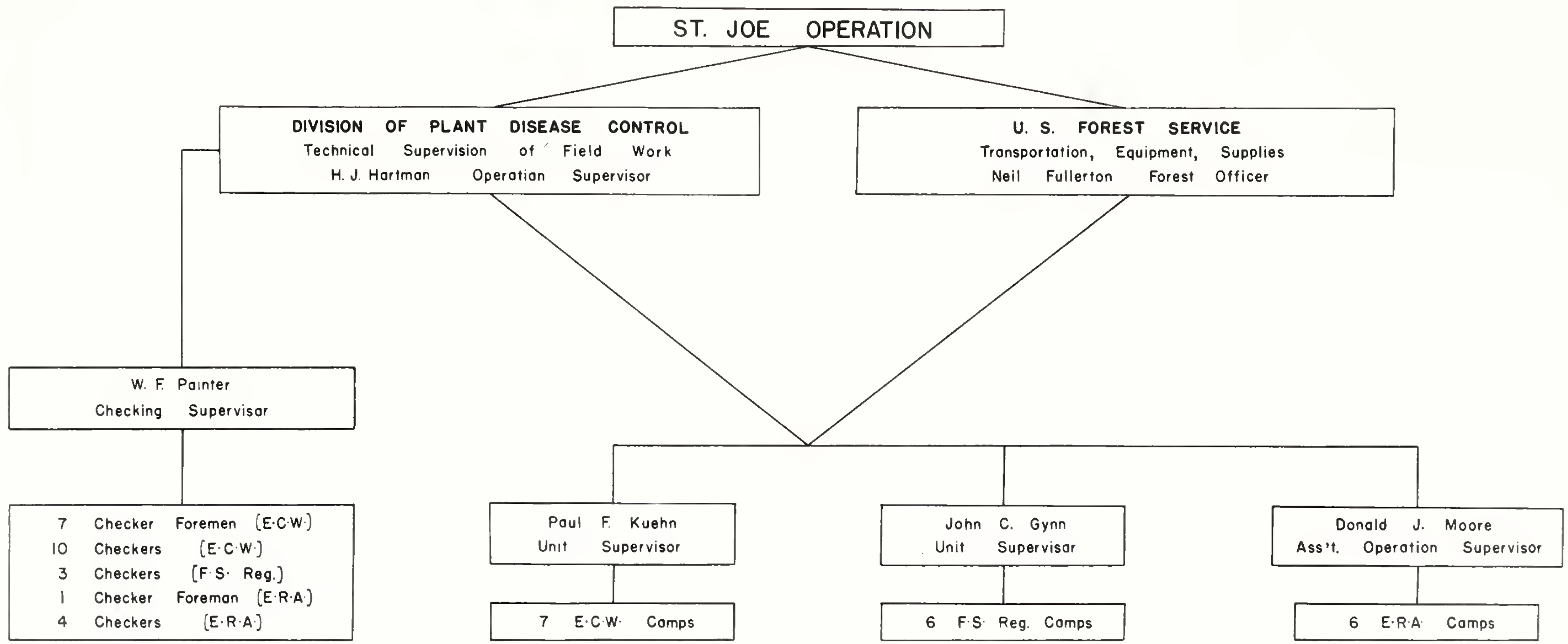
The areas selected for control work were chosen in accordance with [illegible] general policy established by this Division and [illegible] was given to high-value white pine areas in the optimum [illegible] due consideration being afforded the amount of infection present. [illegible] given, also, to the amount of federal, state and private lands [illegible] units. In regard to this, working boundaries were so [illegible] tion of lands treated was governed roughly by the [illegible] tor. Furthermore, since it is essential, for effective control, to [illegible] ly a parcel of land regardless of its ownership, all [illegible] intent of keeping the entire worked area of the operation [illegible]

The work was centered around the Elk Creek and St. Maries River [illegible] The major portion of the area worked had been burned over or logged [illegible] within the last fifty years. In the majority of cases *Ribes lacustre* and *R. viscosissimum* occurred in great abundance. The John Creek [illegible] several areas with heavy concentrations of *R. inerme* in close [illegible] dense brush which were slashed and burned. Many heavy concentrations of *R.* [illegible] existed on the Elk Creek and West Fork of [illegible]

ORGANIZATION AND ADMINISTRATION

A forest officer of the St. Joe National Forest [illegible]

ORGANIZATION CHART



E·C·W·
Number of Camps – 7
4 100 % Camps
3 50 % Camps
Number of Men on Blister Rust Work – 1070

FOREST SERVICE REGULAR
6 32 – man Camps
Number of Men on Blister Rust Work – 190

E·R·A·
Number of Camps – 6
5 66 – man Camps
1 32 – man Camp
Number of Men on Blister Rust Work – 355

Total Number of Men on Blister Rust Work – 1615

ANNUAL REPORT 1935
H J HARTMAN

Division of Plant Disease Control were jointly in charge of the 1935 operation.

The responsibilities of each cooperator in the prosecution of the joint project were as follows:

Responsibilities of Forest Service.

1. Supply and organization of all transportation and furnishing of equipment and supplies for all Forest Service camps.

2. The employment and appointments of all men in Forest Service camps. Selections in supervisory personnel were approved by the Division of Plant Disease Control operation supervisor.

3. All regulations and policies pertaining to vouchers, payrolls, financial control, compensation cases, etc., in connection with Forest Service camps.

Responsibilities of Idaho State Forester's Office.

This pertains only to State and Private ECW camps assigned to blister rust control work.

1. Furnish transportation, equipment and field supplies.

2. Employment of all supervisory personnel with joint approval of the Division of Plant Disease Control and the Regional Forester.

3. All regulations pertaining to financial control, requisitions, purchases, payrolls, etc.

Responsibilities of Division of Plant Disease Control.

1. The development of a general plan of control to include federal, state and private lands.

2. The preliminary examination of all areas to determine working methods.

3. The technical direction of all control work.

4. Establishment, management, maintenance and financial control of all camps financed by the Division.

5. The checking of all control work to determine its efficiency.

6. The summarization of all control work.

The Clarkia Ranger Station at Clarkia, Idaho, was used as the supply base and headquarters for all camps. All field operations were directed through this point. The machinery of the organization was so set up and administered as to give full cooperation to the Army personnel at all times. See accompanying organization chart for details.

METHODS AND EQUIPMENT

Ribes eradication on the operation was accomplished by four methods,

namely, hand pulling, chemical application, slashing, and, a recent development, decapitation. Some variation in the standard methods of hand eradication was necessitated owing to the widely different types of labor available. Work in ECW camps was, in general, conducted according to practice developed in previous years. ECW foremen divided their men into crews of three to five men depending upon the number and quality of leaders available. In many cases, especially on open reproduction areas and near the end of the season, string lines were laid in advance and the foremen worked all of their crews side by side to permit closer supervision and greater efficiency.

In regular Forest Service 30-man camps greater efficiency was attained through the application of several new features in hand eradication. The three-man crew was used practically throughout. Proper allocation of crews within the area to permit closer supervision combined with relatively small assignments for each crew was responsible for greater output. Instead of one crew being assigned to a whole crew division, from two to eight crews were given comparable assignments within a division, thereby promoting competitive interest as well as that created psychologically by progressive change. To enhance further interest among the men a large-scale progress map was prepared by the foreman showing the camp area in detail; this with a table of each day's progress was posted and referred to during technical instruction of the men.

Crew divisions were laid out with boundaries on section lines or in cardinal directions whenever practical which provided better coordination with the checkers and led to a more systematic completion of areas.

Methods of rework were given much attention. Areas on which Ribes concentrations were medium or heavy were covered three or four days following the initial working by a capable one-man rework crew. In this manner the regular crews were relieved of any undue and inefficient searching.

In order to eliminate coverage of Ribes-free areas a complete advance survey made by the checkers was performed on all areas. An advance survey map was prepared for use in locating those areas on which eradication work was necessary; only these areas were covered by crews.

The best personnel were assigned to the areas that could be worked most rapidly.

The matter of securing efficient work in ERA camps presented a difficult problem. The selection of men from relief rolls provided a totally inexperienced class of labor. They were, in general, men capable of less than average output. The ERA organization also limited the number of technically trained men for field supervision to one for every fifty men. This required modifications in hand eradication methods. In many cases four to six-man crews were used with the crew leader following behind, and at all times crews were concentrated for best supervision.

Suitable men for dependable rework crews were lacking among relief men. Rework was usually done with a large group under close supervision or by the entire crew.

Chemical eradication was performed by five-man crews using the regular knapsack spray outfit. An Atlacide solution of one pound per gallon of water was

namely, hand pulling, chemical application, el ehing, etc. Decent variations
in the standard methods of hand eradication and
necessitated owing to the widely different types of labor available.
camps was, in general, conducted according to practice developed in ...
ECW foremen divided their men into crews of three to five men depending upon
number and quality of leaders available. In many cases, especially in good production areas and near the end of the season, string lines were laid in and the foremen worked all of their crews side by side to permit closer supervision and greater efficiency.

In regular Forest Service 50-man camps greater efficiency was attained through the application of several new features in Ribes eradication. The 50-man crew was used practically throughout. Proper allocation of crews within an area to permit closer supervision combined with relatively small assignments for each crew was responsible for greater output. Instead of one crew being assigned to a whole crew division, from two to eight crews were given comparable assignments within a division, thereby promoting competition. Interest in work in areas was created psychologically by progressive change. To enhance further interest among the men a large-scale progress map was prepared by the foreman showing the work area in detail; this with a table of each day's progress was useful and referred to during technical instruction of the men.

Crew divisions were laid out with boundaries in straight lines of the cardinal directions whenever practical which provided better coordination with the checkers and led to a more systematic completion of areas.

Methods of rework were given much attention. Areas in which Ribes concentrations were medium or heavy were covered first by five-man crews following the initial working by a capable one-man rework crew. In this manner the crews were relieved of any undue and inefficient searching.

In order to eliminate coverage of Ribes-free areas a detailed reconnaissance survey made by the checkers was performed on all areas. An adequate map was prepared for use in locating those areas on which eradication work was needed and only these areas were covered by crews.

The best personnel were assigned to the areas that could be covered most rapidly.

The matter of securing efficient work in ERA camps presented a difficult problem. The selection of men from relief rolls provided a totally inexperienced class of labor. They were, in general, men unskilled of less than average ability. The ERA organization also limited the number of technically trained men for supervision to one for every fifty men. This required modifications in both eradication methods. In many cases four to six-man crews were used with the crew leader following behind, and at all times crews were concentrated for best supervision.

Suitable men for dependable rework crews were lacking among relief men. Rework was usually done with a large group under close supervision as by the entire crew.

Chemical eradication was performed by five-man crews using the standard knapsack spray outfit. An Atlacide solution of one pound per gallon of water ...

W1609 - Open reproduction stand where very large mature Ribes bushes exist in close association with heavy brush. On this type of area crew output was greatly increased through the application of the decapitation method.

W1615 - Dense pole stand. Areas comparable to this were eliminated from crew work by application of advance survey.

used as spray and applied to R. petiolare only.

The decapitation method of eradicating R. viscosissimum was applied to limited areas in both regular Forest Service and ECW camps. It has proven most successful on open reproduction stands where very large mature Ribes bushes grew in close association with heavy brush. On this type of area it is estimated that the crew output was increased by at least twenty-five percent through the introduction of this method. Very thorough instructions and close supervision are required in order to make this method highly practical. The application of this method should not be emphasized beyond that point where economy and speed are sacrificed. In all cases decapitation was used only as an auxiliary to regular hand eradication.

An analytical study of the relative output of crews in three classes of camps on the St. Joe operation reveals the following comparisons. Regular Forest Service camps proved to have the greatest output per effective man day of any class, exceeding that of comparable camps in 1934 by 15 to 20 percent. Man-day output for ECW camps was slightly greater this year than last, and approached 60 percent of the output of regular Forest Service camps. ERA records indicate an output per man day of less than 40 percent of that attained by regular Forest Service camps. The relatively low efficiency of ERA camps can be attributed largely to three causes; namely, poor quality of labor, greatly limited supervision, and necessary variation from efficient eradication methods owing to lack of suitable crew leader material. Refinement of methods supervision, and the selection of more experienced personnel are responsible for the greater production of regular Forest Service camps.

The outline of training for supervisory personnel of the various classes of camps was somewhat diversified owing to the lapse of time between the establishment of each class.

In the latter part of May a complete and detailed training was given to nine unit supervisors. Most of these men were later used as camp bosses. Technical instructions for ECW personnel was given each camp group individually at a date immediately preceding the initiation of field work in that camp. This was followed by weekly instructions given by the unit supervisor during his tour of inspection.

W1232 - Series of pictures taken at mouth of Merry Creek near Clarkia, Idaho. Upper picture, taken fall of 1933, shows stream type area after the brush had been slashed and piled for burning in which R. inerme and other species of Ribes were very abundant. Center picture is the same area following burning in 1933. Lower picture, taken fall of 1935, shows the same area two years following burning. Heavy grass sod is being formed and Ribes seedlings are few.

CHECKING

The checking organization in addition to performing the regular checking on areas following Ribes eradication assisted and cooperated with the eradication personnel in every way possible in order to increase efficiency and expedite the work.

Immediately following the establishment of a camp an advance survey of the camp area was made by the checkers in the camp. This survey, although somewhat extensive, gave an immediate picture of the number and distribution of the Ribes on the area. The survey assisted in establishing type boundaries and definitely tied in the camp area with known land surveys. The checking strips were run parallel in cardinal directions at ten-chain intervals. On areas that appeared to be relatively free of Ribes following the two percent survey an additional strip was run which made the interval between strips five chains. If no work was necessary on the area this survey constituted the final check on the area. The survey assisted the eradication personnel in blocking out areas to be worked and they were able to concentrate the crews on areas that actually required working.

Final checking data were plotted on maps, scale four inches to the mile, showing total number of bushes and number of feet of live stem for each five chains along the strip. All upland areas were covered with a four percent check. Stream type areas were covered with an eight percent check as a minimum.

The checkers in the regular Forest Service camps checked 11,033 acres at a cost of 9.5 cents per acre. In the ERA camps 18,138 acres were checked at a cost of 9 cents per acre. In the ECW camps 34,081 acres were checked at a cost of 20 cents per acre. The cost of checking was considerably higher in the ECW camps due to the fact that numerous areas were checked several times. The average checking cost for all camps was 15 cents per acre.

PREERADICATION

A preeradication survey was conducted in late October on a portion of land confined to the Flat and Old Soldier Creek drainages near St. Maries, Idaho. The compass-strip method was used which embodied the running of strips 13.2 feet wide in cardinal directions at twenty-chain intervals. Data recorded included the following:

1. Working conditions of upland types confronting Ribes eradication, symbolically recorded for every five-chain transect along the strip.
2. Number of western white pine by age class for every alternate transect.
3. Location of roads, trails, streams, and timber type boundaries.
4. Width and working conditions of stream type on all streams encountered.

Seventy-four miles of strip were run covering twelve thousand acres and required nineteen man-days to complete. The map presenting the recorded data furnishes reliable information relative to Ribes eradication and to the stocking of western white pine. Estimates of what portions of land sufficiently well stocked to warrant blister rust control work and of the approximate cost of treatment per acre may easily be made from this map.

The checking organization is [illegible] on areas following [illegible] application [illegible] personnel in every way possible in [illegible] work.

Immediately following [illegible] the [illegible] the [illegible] that [illegible], [illegible] to [illegible] lines on the [illegible]. The [illegible] initially [illegible] on the [illegible] run parallel [illegible] to be relatively free [illegible] following the [illegible] and [illegible] between [illegible] of the [illegible] survey [illegible] the [illegible] assisted the application [illegible] were able to [illegible].

Final checking [illegible] showing total number of [illegible] along the strips. [illegible] [illegible] were [illegible].

The [illegible] of the [illegible] of a cost of [illegible] cents per acre. [illegible] a cost of [illegible] [illegible] of [illegible] cents per acre. The cost of checking [illegible] and to the fact that [illegible] [illegible] cost [illegible] all areas was [illegible] cents per acre.

[illegible]

A [illegible] survey was [illegible] land [illegible] at the [illegible]. The [illegible] with [illegible] following:

1. [illegible]
2. Number of [illegible] transect.
3. Location of [illegible].
4. [illegible] and [illegible] ed.

Seventy-four miles of [illegible] required nineteen man-days to [illegible] furnishes reliable information [illegible] of western white pine. [illegible] to prevent blister rust control [illegible] more may easily be made from this data.

STATEMENT OF EXPENDITURES AND COSTS

The statement of expenditures and costs includes those funds expended from appropriations directly allotted to the Bureau of Entomology and Plant Quarantine and the United States Forest Service. The direct appropriations to the Bureau of Entomology and Plant Quarantine and the United States Forest Service were those allotted under NIRA, the Emergency Relief Act, and the regular appropriations for blister rust control work.

No complete costs are available for ECW work except those incurred by the Bureau of Entomology and Plant Quarantine in the course of providing technical supervision to ECW work.

Effective man days in the following tabulations represent eight hours of work in the field by men actually engaged in the eradication of Ribes.

On account of the late season start of the ERA work and the maintenance of the camps in the field later than the normal operating season, the number of effective man days under this program for the 1935 season is considerably lower in relation to costs than it would be in the case of a full season of work. Consequently, the cost per effective man day is higher than it would be under normal conditions.

TABLE NO. 1

EXPENDITURES BY APPROPRIATIONS, CALENDAR YEAR 1935
ST. JOE OPERATION

Cooperating Agency	Appropriation	Amount
	Impnira	$ 5,551.84
	Lieunira	148.40
	Regular	49,040.91
	ERA	6,808.40
Forest Service	Total	61,549.55
	NIRA	12,278.17
	Regular	2,306.13
Bureau of Entomology	ERA	48,733.76
and Plant Quarantine	Total	63,318.06
Total Expenditures	All appropriations	$124,867.61

STATEMENT OF EXPENDITURES AND COSTS

The statement of expenditures and costs includes [illegible] from appropriations directly allotted to the Bureau of Entomology and Plant Quarantine and the United States Forest Service. [illegible] of Entomology and Plant Quarantine and the [illegible] allotted under [illegible], the Emergency Relief Act, [illegible] blister rust control work.

No complete costs are available for [illegible] work [illegible] Bureau of Entomology and Plant Quarantine in the course of [illegible] supervision to [illegible] work.

Effective man days in the following tabulations [illegible] work in the field by men actually engaged in the prosecution of [illegible].

On account of the [illegible] of the camps in the field later than the [illegible] effective man days [illegible] relation to costs than it would be in the case of a [illegible] quently, the cost per effective man day is higher than it would [illegible] conditions.

Table No. [illegible]

EXPENDITURES BY APPROPRIATIONS, [illegible]

Cooperating Agency	Appropriation	Amount
Forest Service	Salaries	[illegible]
	Expenses	[illegible]
	[illegible]	[illegible]
	ECW	[illegible]
	Total	[illegible]
Bureau of Entomology and Plant Quarantine	ECW	[illegible]
	Regular	[illegible]
	[illegible]	[illegible]
	Total	[illegible]
Total Expenditures - (all appropriations)		[illegible]

TABLE NO. 2

CLASSIFIED EXPENDITURES, CALENDAR YEAR 1935
ST. JOE OPERATION

Item	Forest Service				Bureau of Entomology and Plant Quarantine				Total
	NIRA	Regular	ERA	Total	NIRA	Regular	ERA	Total	
Salaries, perm. men	$ 893.26	$ 1,333.30	$	$ 2,226.56	$ 4,358.15	$2,079.13	$ 1,357.13	$ 7,794.41	$ 10,020.97
Sal. temp. app. men					1,352.49		7,462.13	8,814.62	8,814.62
Wages, temp. lab.	2,281.30	39,737.24	4,703.00	46,721.54	4,113.01	101.22	25,863.71	30,077.94	76,799.48
Subsistence sup.	2,537.18	7,875.45	1,864.07	12,276.70	71.85	30.67	10,381.82	10,484.34	22,761.04
Equipment		90.76		90.76	462.12		226.61	688.73	779.49
Trucks							656.52	656.52	656.52
Travel and trans.	-55.28	8.50		-46.78	745.16	62.58	1,857.86	2,665.60	2,618.82
Twine					75.00			75.00	75.00
Other sup. and ex.	43.78	-4.34	241.33	280.77	1,100.39	32.53	927.98	2,060.90	2,341.67
Total expenditures	5,700.24	49,040.91	6,808.40	61,549.55	12,278.17	2,306.13	48,733.76	63,318.06	124,867.61
Less 2/3 cost of new equipment					308.08		784.26	1,092.34	1,092.34
Plus 1/3 cost of old equipment					3,559.37			3,559.37	3,559.37
Net cost of 1935 operation.	$5,700.24	$49,040.91	$6,808.40	$61,549.55	$15,529.46	$2,306.13	$47,949.50	$65,785.09	$127,334.64

In arriving at effective 8-hour man day costs for the various classes of camps, it is difficult to prorate costs incurred by use of funds to finance training schools, pre-season surveys, and other activities incidental to starting the field work. It should be born in mind that the high effective man day costs for ERA work are a direct result of maintaining camps late in the fall when Ribes eradication work was only possible on a few days.

Activity	Effective Man Day Cost	Total Net Cost
BQ-ERA	$8.64	$ 55,891.03
FS-ERA	8.99	8.016.80
FS-Regular	5.79	54,963.01
Contributed in cooperation with ECW work		8,463.80
Total net cost of 1935 operation		$127,334.64

Additional Information:

Average cost per meal................. $.214
Number of pounds of Atlacide used.....32,121

SUMMARY OF RIBES ERADICATION, 1935
ST. JOE OPERATION

TABLE NO. 3 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Effective Man Days	Total Ribes	Gallons Spray	Ribes Remaining Per Acre	
							Bushes	Live Stem
Open Reproduction	15,735			33,419	17,949,123		7.0	11.4
Dense Reproduction	9,830	143		1,135	272,455		.6	2.7
Open Pole	4,013			2,414	277,001		1.7	6.8
Dense Pole	3,079			308	64,311		.8	4.2
Open Mature	24,301			8,217	2,285,678		2.7	7.8
Dense Mature	338			40	9,292		3.4	3.0
Cut Over	829	70		491	95,023		2.3	6.6
Burn	1,167			597	488,663		4.3	5.5
All Upland	59,292	213		46,621	21,441,546		3.3	7.6
Stream (Hand)	1,216	1,727	762	6,259	1,590,647			
Stream (Chemical)	139	176	42	1,193	96,363	32,121		
Stream (Slash)	42			566	21,000			
All Stream	1,258	1,727	762	8,018	1,708,010		4.5	11.1
All Types	60,550	1,940	762	54,639	23,149,556		3.6	8.4

TABLE NO. 3A - FIRST WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis			Ribes Remaining Per Acre	
					Man Days	Ribes	Gallons Spray	Bushes	Live Stem
Open Reproduction	15,735	33,419	17,949,123		2.12	1,141		7.0	11.4
Dense Reproduction	9,830	1,055	260,165		.11	26		.6	2.4
Open Pole	4,013	2,414	277,001		.60	69		1.7	6.8
Dense Pole	3,079	308	64,311		.10	21		.8	4.2
Open Mature	24,301	8,217	2,285,678		.34	94		2.7	7.8
Dense Mature	338	40	9,292		.12	27		3.4	3.0
Cut Over	829	490	94,991		.59	115		2.6	7.3
Burn	1,167	597	488,663		.51	419		4.3	5.5
All Upland	59,292	46,540	21,429,224		.78	361		3.4	7.6
Stream (Hand)	1,216	3,412	1,070,556		2.81	880			
Stream (Chemical)	139	822	71,184	23,728	5.91	512	171		
Stream (Slash)	42	566	21,000		13.48	500			
All Stream	1,258	4,800	1,162,740		3.82	924		3.6	8.9
All Types	60,550	51,340	22,591,964		.85	373		3.4	7.7

TABLE NO. 3B - SECOND WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis			Ribes Remaining Per Acre	
					Man Days	Ribes	Gallons Spray	Bushes	Live Stem
Dense Reproduction	143	80	12,290		.56	86		2.8	15.6
Cut Over	70	1	32		.01	1			
All Upland	213	81	12,322		.38	58		2.1	11.7
Stream (Hand)	1,727	1,998	368,512		1.16	213			
Stream (Chemical)	176	266	16,299	5,433	1.51	93	31		
All Stream	1,727	2,264	384,811		1.31	223		5.0	10.1
All Types	1,940	2,345	397,133		1.21	205		4.8	10.1

TABLE NO. 3C - THIRD WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis			Ribes Remaining Per Acre	
					Man Days	Ribes	Gallons Spray	Bushes	Live Stem
Stream (Hand)	762	849	151,579		1.11	199			
Stream (Chemical)	42	105	8,880	2,960	2.50	211	70		
All Stream	762	954	160,459		1.25	211		3.5	11.0

TABLE NO. 4

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1935
ST. JOE OPERATION

Working	Class	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis			Ribes Remaining Per Acre	
						Man Days	Ribes	Gallons Per Sprayed Area	Bushes	Live Stem
First	EQ-ERA	17,871	6,468	1,336,772	54	.36	75	27	2.1	7.8
	FS-ERA	267	892	487,480		3.34	1,826		7.9	11.0
	FS-Reg	10,854	9,332	5,211,354	4,513	.86	480	92	3.5	8.2
	F-ECW	12,666	28,487	14,427,384	19,161	2.25	1,139	218	9.0	15.0
	S-ECW	18,892	6,161	1,128,974		.33	60		1.2	3.8
Second	FS-Reg	179	152	19,450	629	.85	109	16	1.9	6.3
	F-ECW	963	1,038	223,400	1,794	1.08	232	26	12.3	21.3
	S-ECW	798	1,155	154,283	3,010	1.45	193	45	1.5	4.8
Third	F-ECW	693	892	157,601	2,960	1.29	227	70	3.7	11.5
	S-ECW	69	62	2,858		.90	41		1.2	6.1
All Workings	EQ-ERA	17,871	6,468	1,336,772	54	.36	75	27	2.1	7.8
	FS-ERA	267	892	487,480		3.34	1,826		7.9	11.0
	FS-Reg	11,033	9,484	5,230,804	5,142	.86	474	58	3.5	8.2
	F-ECW	14,322	30,417	14,808,385	23,915	2.12	1,034	135	9.0	15.5
	S-ECW	19,759	7,378	1,286,115	3,010	.37	65	45	1.3	4.0

TABLE NO. 5

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1935
ST. JOE OPERATION

Working	Number of Acres Worked by Ownership Classes			Total
	Federal	State - Idaho	Private	
First	16,172	6,109	38,269	60,550
Second	563	261	1,116	1,940
Third	572	71	119	762
All Workings	17,307	6,441	39,504	63,252

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TABLE NO. 6

RESULTS OF CHECKING ON AREAS WORKED DURING 1935
ST. JOE OPERATION

Eradication Type	Average Results for All Areas												Areas With More Than 25 Feet Live Stem Per Acre		
			Ribes Per Acre												
			Ribes lacustre		Ribes viscosissimum		Ribes petiolare		Ribes inerme		All Species			Per Acre	
	Acres in Checked Area	Acres Checked	Bushes	Live Stem	Bushes	Live Stem	Bushes	Live Stem	Bushes	Live Stem	Bushes	Live Stem	Acres	Bushes	Live Stem
Open Reproduction	15,735	632	1.2	2.1	5.8	9.3					7.0	11.4	697	39.0	47.8
Dense Reproduction	9,973	385	.3	1.1	.3	1.6					.6	2.7	17	12.5	48.4
Open Pole	4,013	169	.5	1.7	1.2	5.1					1.7	6.8			
Dense Pole	3,079	127	.4	1.8	.4	2.4					.8	4.2			
Open Mature	24,301	1,001	.9	3.4	1.8	4.4					2.7	7.8	553	27.5	87.8
Dense Mature	338	14	3.2	2.3	.2	.7					3.4	3.0			
Cut Over	899	36	1.7	6.4	.6	.2					2.3	6.6			
Burn	1,167	42	.7	1.7	3.6	3.8					4.3	5.5			
All Upland	59,505	2,406	.8	2.5	2.5	5.1					3.3	7.6	1,267	34.0	63.7
Stream	3,705	635	3.5	8.3	.1	.3	.5	.9	.4	1.6	4.5	11.1	217	30.8	83.1
All Types	63,210	3,041	1.4	3.7	1.9	4.1	.1	.2	.08	.3	3.5	8.3	1,484	33.5	66.5

TABLE NO. 7

TOTAL RIBES BY SPECIES ERADICATED, 1935
ST. JOE OPERATION

Working	Eradication Type	Acres	Ribes by Species					Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	Ribes irriguum	
First	Open Reproduction	15,735	2,571,514	15,369,399	3,786	2,283	2,141	17,949,123
	Dense Reproduction	9,830	146,683	112,595		562	325	260,165
	Open Pole	4,013	86,293	189,927		781		277,001
	Dense Pole	3,079	33,429	30,882				64,311
	Open Mature	24,301	905,116	1,342,830	200	23,901	13,631	2,285,678
	Dense Mature	338	8,819	473				9,292
	Cut Over	829	64,853	28,981	1,157			94,991
	Burn	1,167	54,820	425,483	7,419	941		488,663
	All Upland	59,292	3,871,527	17,500,570	12,562	28,468	16,097	21,429,224
	Stream	1,258	829,054	112,275	73,317	142,762	5,332	1,162,740
	All Types	60,550	4,700,581	17,612,845	85,879	171,230	21,429	22,591,964
Second	Dense Reproduction	143	1,999	10,291				12,290
	Cut Over	70	12			20		32
	All Upland	213	2,011	10,291		20		12,322
	Stream	1,727	278,366	4,737	64,128	37,505	75	384,811
	All Types	1,940	280,377	15,028	64,128	37,525	75	397,133
Third	Stream	762	65,645	45	36,685	58,084		160,459
All Workings	Open Reproduction	15,735	2,571,514	15,369,399	3,786	2,283	2,141	17,949,123
	Dense Reproduction	9,973	148,682	122,886		562	325	272,455
	Open Pole	4,013	86,293	189,927		781		277,001
	Dense Pole	3,079	33,429	30,882				64,311
	Open Mature	24,301	905,116	1,342,830	200	23,901	13,631	2,285,678
	Dense Mature	338	8,819	473				9,292
	Cut Over	899	64,865	28,981	1,157	20		95,023
	Burn	1,167	54,820	425,483	7,419	941		488,663
	All Upland	59,505	3,873,538	17,510,861	12,562	28,488	16,097	21,441,546
	Stream	3,747	1,173,065	117,057	174,130	238,351	5,407	1,708,010
	All Types	63,252	5,046,603	17,627,918	186,692	266,839	21,504	23,149,556

SUMMARY OF RIBES ERADICATION, 1929-1935
ST. JOE OPERATION

TABLE NO. 8 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Effective Man Days	Total Ribes	Gallons Spray
Open Reproduction	111,572	415		128,195	48,551,740	
Dense Reproduction	36,175	443		9,890	1,518,544	
Open Pole	37,544			15,654	3,401,782	
Dense Pole	15,720			3,902	815,179	
Open Mature	99,555	1,390		44,281	12,931,053	
Dense Mature	6,656			1,438	238,263	
Cut Over	1,009	70		655	100,364	
Brush	2,452			1,881	676,620	
Burn	1,435			662	504,191	
Subalpine	200			416	90,809	
All Upland	312,318	2,318		206,974	68,828,545	
Stream (Hand)	30,189	6,063	1,298	58,229	16,177,857	
Stream (Chemical)	5,220	1,348	56	16,078	1,349,481	449,827
Stream (Slash)	781	24		10,235	402,500	
All Stream	30,970	6,087	1,298	84,542	17,929,838	
All Types	343,288	8,405	1,298	291,516	86,758,383	

TABLE NO. 8A - FIRST WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis Man Days	Ribes	Gallons Spray
Open Reproduction	111,572	128,093	48,521,140		1.15	435	
Dense Reproduction	36,175	9,760	1,497,390		.27	41	
Open Pole	37,544	15,654	3,401,782		.42	91	
Dense Pole	15,720	3,902	815,179		.25	52	
Open Mature	99,555	43,997	12,880,101		.44	129	
Dense Mature	6,656	1,438	238,263		.22	36	
Cut Over	1,009	654	100,332		.65	99	
Brush	2,452	1,881	676,620		.77	276	
Burn	1,435	662	504,191		.46	351	
Subalpine	200	416	90,809		2.08	454	
All Upland	312,318	206,457	68,725,807		.66	220	
Stream (Hand)	30,189	46,492	13,898,680		1.54	460	
Stream (Chemical)	5,220	13,598	1,156,113	385,371	2.60	221	74
Stream (Slash)	781	9,955	390,500		12.75	500	
All Stream	30,970	70,045	15,445,293		2.26	499	
All Types	343,288	276,502	84,171,100		.81	245	

TABLE NO. 8B - SECOND WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis Man Days	Ribes	Gallons Spray
Open Reproduction	415	102	30,600		.25	74	
Dense Reproduction	443	130	21,154		.29	48	
Open Mature	1,390	284	50,952		.20	37	
Cut Over	70	1	32		.01	1	
All Upland	2,318	517	102,738		.22	44	
Stream (Hand)	6,063	9,560	1,944,475		1.58	321	
Stream (Chemical)	1,348	2,344	181,122	60,374	1.74	134	45
Stream (Slash)	24	280	12,000		11.67	500	
All Stream	6,087	12,184	2,137,597		2.00	351	
All Types	8,405	12,701	2,240,335		1.51	267	

TABLE NO. 8C - THIRD WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis Man Days	Ribes	Gallons Spray
Stream (Hand)	1,298	2,177	334,702		1.68	258	
Stream (Chemical)	56	136	12,246	4,082	2.43	219	73
All Stream	1,298	2,313	346,948		1.78	267	

TABLE NO. 9

TOTAL RIBES BY SPECIES ERADICATED, 1929-1935
ST. JOE OPERATION

Working	Eradication Type	Acres	Ribes by Species: Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	Ribes irriguum	Total Ribes
First	Open Reproduction	111,572	9,147,699	39,002,852	91,216	251,514	27,859	48,521,140
	Dense Reproduction	36,175	766,167	677,802	13,263	27,287	12,871	1,497,390
	Open Pole	37,544	1,281,113	2,032,657	19,610	59,187	9,215	3,401,782
	Dense Pole	15,720	413,740	397,930	1,335	1,973	201	815,179
	Open Mature	99,555	6,822,952	5,987,794	18,079	33,000	18,276	12,880,101
	Dense Mature	6,656	154,599	83,275	389			238,263
	Cut Over	1,009	64,897	30,125	5,269	41		100,332
	Brush	2,452	93,470	579,731	1,987	1,432		676,620
	Burn	1,435	69,778	425,487	7,985	941		504,191
	Subalpine	200	54,975	35,834				90,809
	All Upland	312,318	18,869,390	49,253,487	159,133	375,375	68,422	68,725,807
	Stream	30,970	10,389,055	752,896	2,452,798	1,840,533	10,011	15,445,293
	All Types	343,288	29,258,445	50,006,383	2,611,931	2,215,908	78,433	84,171,100
Second	Open Reproduction	415	10,200	20,400				30,600
	Dense Reproduction	443	10,298	10,856				21,154
	Open Mature	1,390	31,376	19,545	31			50,952
	Cut Over	70	12			20		32
	All Upland	2,318	51,886	50,801	31	20		102,738
	Stream	6,087	1,181,262	53,779	534,021	368,460	75	2,137,597
	All Types	8,405	1,233,148	104,580	534,052	368,480	75	2,240,335
Third	Stream	1,298	147,046	3,930	107,325	88,647		346,948
All Workings	Open Reproduction	111,987	9,157,899	39,023,252	91,216	251,514	27,859	48,551,740
	Dense Reproduction	36,618	776,465	688,658	13,263	27,287	12,871	1,518,544
	Open Pole	37,544	1,281,113	2,032,657	19,610	59,187	9,215	3,401,782
	Dense Pole	15,720	413,740	397,930	1,335	1,973	201	815,179
	Open Mature	100,945	6,854,328	6,007,339	18,110	33,000	18,276	12,931,053
	Dense Mature	6,656	154,599	83,275	389			238,263
	Cut Over	1,079	64,909	30,125	5,269	61		100,364
	Brush	2,452	93,470	579,731	1,987	1,432		676,620
	Burn	1,435	69,778	425,487	7,985	941		504,191
	Subalpine	200	54,975	35,834				90,809
	All Upland	314,636	18,921,276	49,304,288	159,164	375,395	68,422	68,828,545
	Stream	38,355	11,717,363	810,605	3,094,144	2,297,640	10,086	17,929,838
	All Types	352,991	30,638,639	50,114,893	3,253,308	2,673,035	78,508	86,758,383

TABLE NO. 10

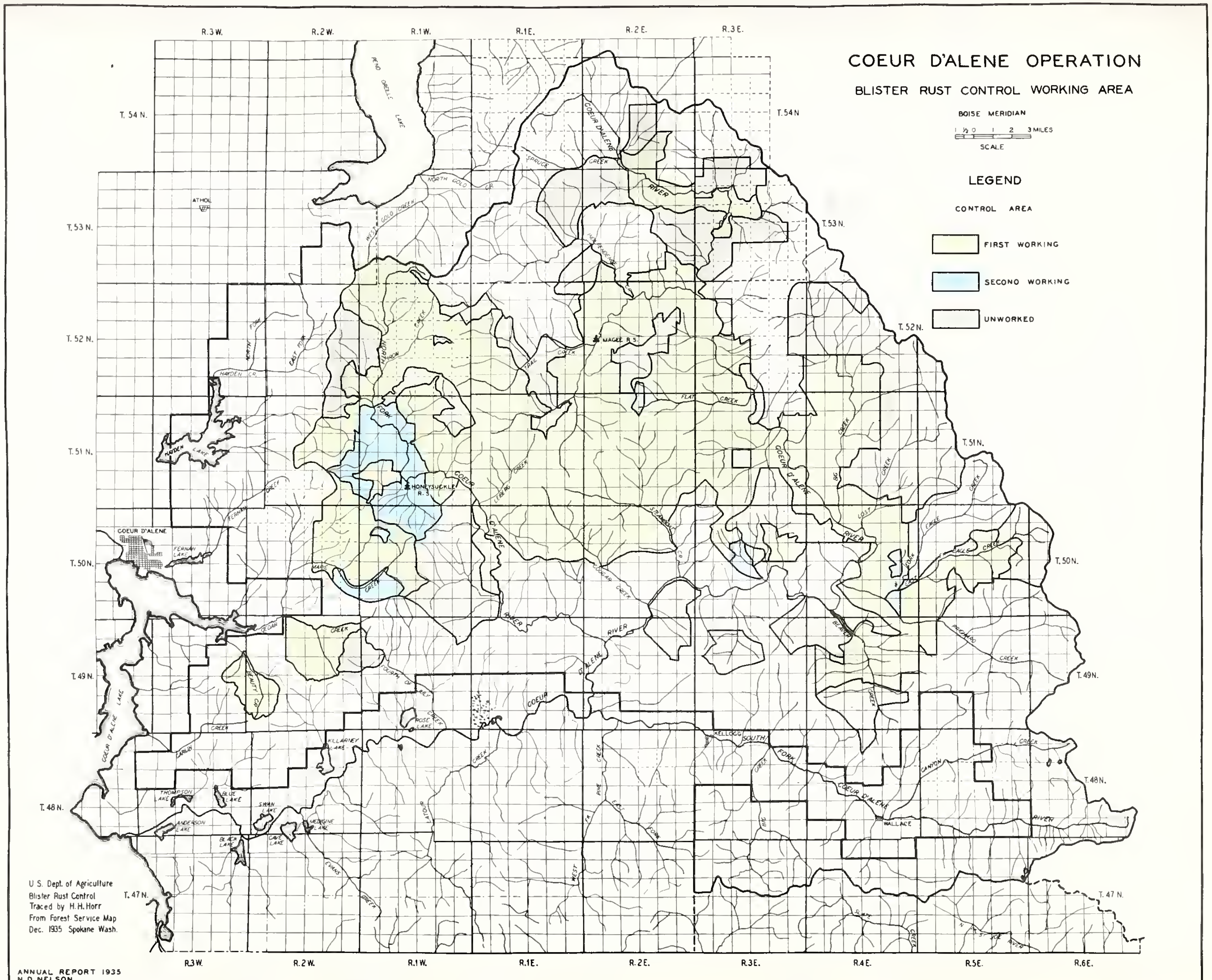
OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1929-1935
ST. JOE OPERATION

Working	Number of Acres Worked by Ownership Classes: Federal	State - Idaho	Private	Total
First	132,990	38,967	171,331	343,288
Second	1,857	1,343	5,205	8,405
Third	782	71	445	1,298
All Workings	135,629	40,381	176,981	352,991

TABLE NO. 11

PROGRESS OF FIRST WORKING BY OWNERSHIP CLASSES, 1929-1935
ST. JOE OPERATION

Ownership Class	Number of Acres: Worked	Unworked	Total
Federal	132,990	242,204	375,194
State-Idaho	38,967	82,060	121,027
Private	171,331	317,533	488,864
Total	343,288	641,797	985,085


COEUR D'ALENE OPERATION
BLISTER RUST CONTROL WORKING AREA
BOISE MERIDIAN
1 ½ 0 1 2 3 MILES
SCALE
LEGEND
CONTROL AREA
FIRST WORKING
SECOND WORKING
UNWORKED
R.3W.
R.2W.
R.1W.
R.1E.
R.2E.
R.3E.
R.4E.
R.5E.
R.6E.
T. 54 N.
T. 53 N.
T. 52 N.
T. 51 N.
T. 50 N.
T. 49 N.
T. 48 N.
T. 47 N.
PEND OREILLE LAKE
ATHOL
HAYDEN LAKE
COEUR D'ALENE
FERNAN LAKE
COEUR D'ALENE LAKE
MAGEE R.S.
HONEYSUCKLE R.S.
KELLOGG
WALLACE
COEUR D'ALENE RIVER
SOUTH FORK
NORTH FORK
U.S. Dept. of Agriculture
Blister Rust Control
Traced by H.H. Horr
From Forest Service Map
Dec. 1935 Spokane Wash.
ANNUAL REPORT 1935
N D NELSON

RIBES ERADICATION, COEUR D'ALENE OPERATION, 1935

By
Neal D. Nelson,
Associate Pathologist

INTRODUCTION

At the close of the 1935 field season 262,021 acres have been given initial eradication, and 17,593 acres second eradication. On the basis of the control area outlined in the fall of 1934 which included 324,323 acres, there remain 62,302 acres yet to be worked on initial eradication.

On the basis of further surveys made in 1935 and the extension of the planting program of the forest, additional areas were located which should be included in the blister rust control program. These areas comprise largely 1910, 1919, and 1926 burns which have now begun to sustain excellent stands of young white pine. These additional areas contain 23,800 acres, which if included in the control program, would leave 86,102 acres requiring initial eradication.

In addition there are approximately 50,000 acres, which, when further information is obtained, may be placed in the control area.

Control work for 1935 was carried on by 14 ECW camps, 9 ERA camps and 1 bulldozer camp. The ECW camps were engaged in blister rust control work from June 1 to October 1, and the ERA camps during the period from July 11 to October 13.

Four of the ERA camps were financed by allotments under the Emergency Relief Act to the Bureau of Entomology and Plant Quarantine, and the other five by similar funds allotted to the U. S. Forest Service. The bulldozer operation was financed by regular funds allotted to the U. S. Forest Service for blister rust control work.

LOCATION AND DESCRIPTION OF AREAS

Camps were distributed throughout the entire forest, and control work was done in all eradication types.

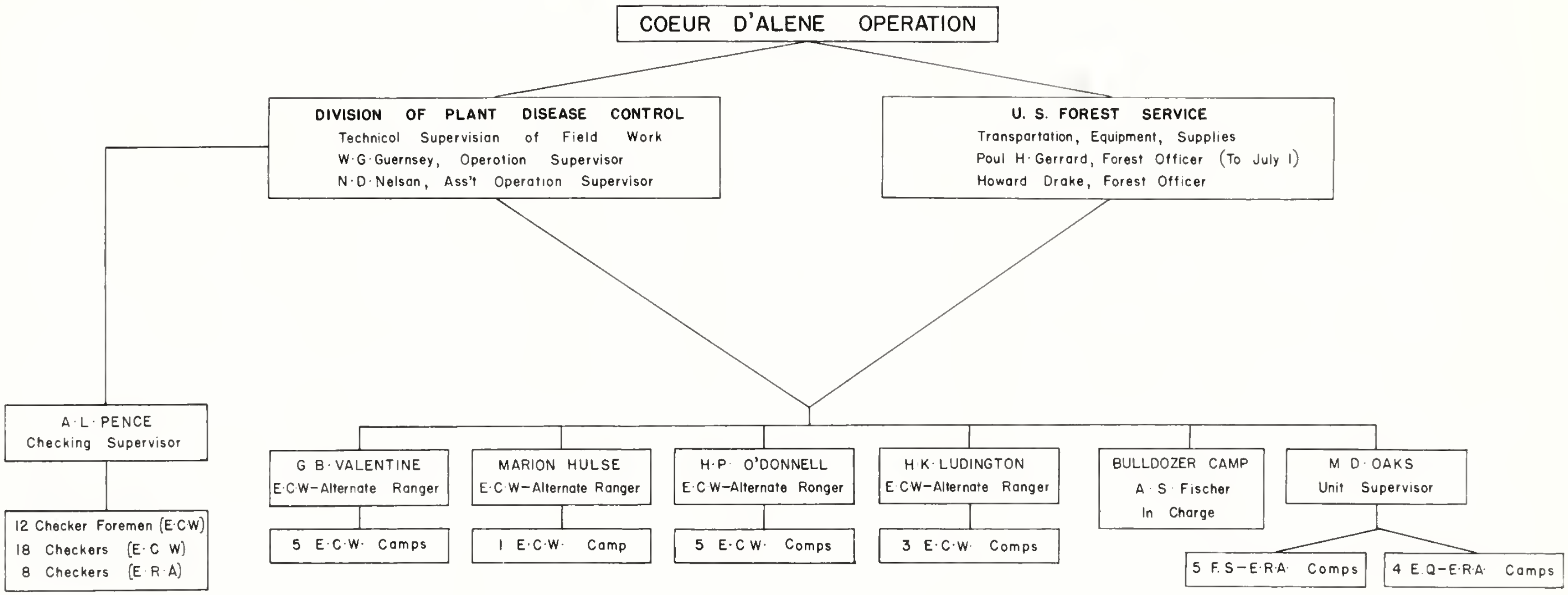
Almost fifty percent of the total effective man days were expended on open reproduction. Most of this type represented a difficult eradication problem. The young trees are closely associated with various species of brush. While there are not heavy concentrations of Ribes throughout this type, the searching time is high; consequently the man days are high in proportion to the number of Ribes pulled. In the other eradication types conditions were similar to those encountered in 1933 and 1934.

With the exception of one ERA camp, all camps were located on roads. This was necessary due to the lateness of the season when the ERA program was started. However, these camps were so placed that the areas worked were for the most part adjacent to areas previously worked.

ORGANIZATION AND ADMINISTRATION

The general administration of the work was somewhat the same as in past

ORGANIZATION CHART



E·C·W·

Number of Camps — 14
- 2 — 100 % Camps
- 2 — 92 % Camps
- 3 — 80 % Comps
- 2 — 75 % Comps
- 2 — 70 % Camps
- 1 — 66 % Camp
- 1 — 33 % Camp
- 1 — 17 % Camp

Number of Men on Blister Rust — 1392

FOREST SERVICE REGULAR

Bulldozer Comp
Number of Men – 9

E·R·A·

Number of Camps — 9
- 5 – 60 Mon F·S·Camps
- 4 – 66 Mon E·Q·Camps

Number af Men on Blister Rust – 564

Totol Number of Men on Blister Rust Work — 1965

ANNUAL REPORT 1935
N·D·NELSON

years. A U. S. Forest Service officer and an operation supervisor of the Bureau of Entomology and Plant Quarantine were jointly in charge of blister rust control work. The Forest officer was in charge of equipment, supplies, and transportation, while the operation supervisor of the Bureau of Entomology and Plant Quarantine was in charge of the technical phases of the work.

P. H. Gerrard was assigned as forest officer on blister rust control work. Effective July 1, 1935 he was transferred from the Coeur d'Alene National Forest to U. S. Forest Region No. 8. Howard Drake, logging engineer of the Coeur d'Alene National Forest was then assigned to take over the duties of Mr. Gerrard.

W. G. Guernsey, operation supervisor for the Bureau of Entomology and Plant Quarantine for the Coeur d'Alene operation, accepted an assignment with the U. S. Forest Service effective July 1, 1935. Through an arrangement with the U. S. Forest Service, Mr. Guernsey continued to represent the Bureau of Entomology and Plant Quarantine as operation supervisor until October 15, 1935, at which time his duties were taken over by N. D. Nelson of the Bureau of Entomology and Plant Quarantine.

CHECKING

A separately supervised organization checked the efficiency of all areas worked by the eradication crews. This sample check consisted of an inspection for missed Ribes on parallel strips 1/5 of a chain in width run at intervals of five chains in cardinal directions. When these missed Ribes were plotted on a 4-inch to the mile map along the strip where found, the operation supervisor was able to select those areas that needed additional work.

Advance checking was performed on areas that were relatively free from Ribes. By this method a number of areas were eliminated from crew work. Checkers also assisted the camp foremen by blocking out areas for rework, running rework crews, stringing crew division boundaries and keeping the eradication data maps up to date.

Approximately 5000 acres of area worked in 1933 werecovered with a 4-percent check. These areas had been logged prior to the 1933 eradication. Seedlings were found to be abundant during that season. It was necessary to secure information regarding the germination and survival of seedlings subsequent to the eradication. It was discovered that germination had apparently ceased, and that a limited number of Ribes had survived, those having attained a size of from four to eight feet of live stem.

The average cost per acre for checking in ECW camps was 19.8 cents, in FS ERA camps 14.6 cents, and in EQ ERA camps, it was 13.1 cents per acre. The average per acre checking cost for the entire operation was 19 cents.

METHODS AND EQUIPMENT

A training camp was conducted during the first fifteen days of May 1935. Personnel attending were: Forest officers, district rangers, ECW alternate rangers, unit supervisors, (for proposed ERA camps), ECW camp superintendents, ECW foremen, and representatives of the Bureau of Entomology and Plant Quarantine in charge of

the technical phases of the blister rust control work.

General meetings were held, and foremanship, fire control and reports were discussed. After two days of general meetings, the personnel were divided into groups, and training was given on the special projects to be handled. Two days were spent in this manner, and then the personnel were assigned to their respective camps. During the second week of the school a new group of ECW foremen reported to the school and the same procedure was followed.

Due to lack of funds for training, about one-half of the ECW foremen did not attend the training camp, but were trained as they reported to their respective camps.

No ERA camp bosses attended a training camp due to the lateness of the starting of the camps.

Three eradication methods were used--namely, hand eradication, machine (or bulldozer) and slashing.

Hand eradication methods used were very similar to those used in the past, with three men comprising a crew, one of whom acted as crew leader. Work areas were divided into crew divisions, and each crew given the responsibility of doing the work satisfactorily on the areas to which it was assigned. Due to the quality of men in ECW camps, some four-man crews were used.

Machine (or bulldozer) methods were used in heavy brush and Ribes areas along streams. Methods employed in this work were very similar to those of past years.

Slashing methods were used on one area of private land where the owner would not permit the clearing of the area by a bulldozer, and on another small area on which it was deemed more practical to clear the area immediately rather than wait at least two years until the bulldozer would be available. On the first of the aforementioned areas, crews worked in line as in hand eradication, each man clearing a strip of about twelve feet. Brush was piled and Ribes roots pulled by the man doing the slashing. Up until September 15 the brush was piled in windrows, thereafter being piled in large piles. Brush burning was started about October 1. On the second area methods of slashing were the same except that the brush was burned as it was slashed. Men doing the slashing disposed of the brush they slashed by putting it on convenient fires. Pulaski tools and Little Giant brush hooks were found to be the most effective tools for slashing work.

PREERADICATION AND SURVEYS

An advance survey on 5,226 acres was made by checkers from ECW camps. Strips were run at twenty-chain intervals and data recorded to show the number of white pine and other tree species and the Ribes conditions for each five chains along the strip. This survey showed that the entire acreage inspected supported excellent stands of white pine reproduction averaging from 100 trees to 600 trees per acre.

A rapid and general survey was made late in the season to determine the

amount of blister rust infection on Ribes viscosissimum occurring in upland types. The results showed that blister rust infection on this species was distributed generally over the entire control area. Approximately 5 percent of the bushes examined were found to be infected.

On a pine disease survey made during the late fall, 5,658 trees from 3 feet to 15 feet in height were examined; 37 trees or 0.65 percent were found to be infected. Additional inspections were made on areas where pine infection was known to be present. The trees examined were for the most part fifteen feet in height or over. Of the 3,847 trees that were examined, 166 trees or 4.3 percent were found to be infected.

STATEMENT OF EXPENDITURES AND COSTS

The statement of expenditures and costs includes those funds expended from appropriations directly allotted to the Bureau of Entomology and Plant Quarantine and the United States Forest Service. The direct appropriations to the Bureau of Entomology and Plant Quarantine and the United States Forest Service were those allotted under NIRA, the Emergency Relief Act, and the regular appropriations for blister rust control work.

No complete costs are available for ECW work except those incurred by the Bureau of Entomology and Plant Quarantine in the course of providing technical supervision to ECW work.

Effective man days in the following tabulations represent eight hours of work in the field by men actually engaged in the eradication of Ribes.

On account of the late season start of the ERA work and the maintenance of the camps in the field later than the normal operating season, the number of effective man days under this program for the 1935 season is considerably lower in relation to costs than it would be in the case of a full season of work. Consequently, the cost per effective man day is higher than it would be under normal conditions.

TABLE NO. 1

EXPENDITURES BY APPROPRIATIONS, CALENDAR YEAR 1935
COEUR D'ALENE OPERATION

Cooperating Agency	Appropriation	Amount
	Impnira	$ 5,592.00
	Lieunira	13.06
	Regular	7,924.23
	ERA	38,740.30
Forest Service	Total	52,269.59
	Nira	7,085.85
	Regular	2,627.20
Bureau of Entomology	ERA	32,608.78
and Plant Quarantine	Total	42,321.83
Total Expenditures	All Appropriations	$94,591.42

TABLE NO. 2

CLASSIFIED EXPENDITURES, CALENDAR YEAR 1935
COEUR D'ALENE OPERATION

Item	Forest Service				Bureau of Entomology and Plant Quarantine				Total
	NIRA	Regular	ERA	Total	NIRA	Regular	ERA	Total	
Salaries, perm. men	$ 802.38	$2,079.96	$	$ 2,882.34	$4,016.73	$1,994.67	$ 2,007.72	$ 8,019.12	$10,901.46
Sal. temp. appt. men	1,596.62		3,502.82	5,099.44	474.99		2,579.56	3,054.55	8,153.99
Wages, temp. lab.	2,760.47	2,902.14	22,344.56	28,007.17	1,266.42	485.88	17,309.96	19,062.26	47,069.43
Subsistence sup.	-400.00	335.63	8,939.43	8,875.06			7,294.00	7,294.00	16,169.06
Equipment	234.72	2,589.65	2,058.03	4,882.40	166.21		1,128.72	1,294.93	6,177.33
Trucks							656.52	656.52	656.52
Travel and trans.	522.68	14.04	1,766.52	2,303.24	515.16	117.37	834.45	1,466.98	3,77[illegible].22
Twine					75.00			75.00	75.00
Other sup. and exp.	88.19	2.81	128.94	219.94	571.34	29.28	797.85	1,398.47	1,618.41
Total expenditures	$5,605.06	$7,924.23	$38,740.30	$52,269.59	$7,085.85	$2,627.20	$32,608.78	$42,321.83	$94,591.42
Less 2/3 cost of new equipment	122.84	111.94	129.36	364.14	107.47		1,385.66	1,493.13	1,857.27
Plus 1/3 cost of old equipment	1,732.00			1,732.00	356.32			356.32	2,08[illegible].[illegible]
Plus bulldozer depreciation		866.87		866.87					866.87
Net cost of 1935 operation	$7,214.22	$8,679.16	$38,610.94	$54,504.32	$7,334.70	$2,627.20	$31,223.12	$41,185.02	$95,689.[illegible]

In arriving at effective 8-hour man day costs for the various classes of camps, it is difficult to prorate costs incurred by use of funds to finance training schools, pre-season surveys, and other activities incidental to starting the field work.

Activity	Effective Man day Cost	Total Net Cost
EQ-ERA	$8.80	$32,759.36
FS-ERA	8.50	43,040.89
FS-Reg. (bulldozer camp)	14.19	6,925.19
Contributed in cooperation with ECW		12,963.90
Total net cost of 1935 operation		$95,689.34

Average cost per meal......$.219

SUMMARY RIBES ERADICATION 1935
COEUR D'ALENE OPERATION

TABLE NO. 3 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Total Effective Man Days	Total Ribes	Ribes Remaining Per Acre	
					Bushes	Live Stem
Open Reproduction	19,031	154	34,318	5,163,547	2.4	7.0
Dense Reproduction	521		727	58,329	3.0	6.6
Open Pole	5,545	174	3,435	544,526	1.5	4.9
Dense Pole	5,460		1,112	257,746	0.5	2.1
Open Mature	13,443	790	11,114	1,529,165	2.2	7.1
Dense Mature	2,156		605	60,213	0.8	1.4
Cut Over	2,099	364	3,017	363,464	2.5	3.9
Brush	3,754		3,956	407,799	1.6	5.5
Burn	4,081		2,481	410,311	1.3	3.6
Subalpine	24		5	111		
All Upland	56,114	1,482	60,770	8,795,211	2.0	5.7
Stream (Hand)	2,621	500	11,283	2,363,293	4.2	8.5
Stream (Slash)	55	13	1,575	58,231		
Stream (Machine)	171		488	85,500		
All Stream	2,847	513	13,346	2,507,024	4.2	8.5
All Types	58,961	1,995	74,116	11,302,235	2.5	6.3

TABLE NO. 3A - FIRST WORKING

Eradication Type	Acres First Working	Effective Man Days	Total Ribes	Per Acre Basis		Ribes Remaining Per Acre	
				Man Days	Ribes	Bushes	Live Stem
Open Reproduction	19,031	34,136	5,145,963	1.79	270	2.5	6.9
Dense Reproduction	521	727	58,329	1.39	112	3.0	6.6
Open Pole	5,545	3,120	523,199	.56	94	1.4	4.8
Dense Pole	5,460	1,112	257,746	.20	47	0.5	2.1
Open Mature	13,443	10,193	1,443,330	.76	107	2.1	7.0
Dense Mature	2,156	605	60,213	.28	28	0.8	1.4
Cut Over	2,099	2,725	308,748	1.30	147	2.6	3.4
Brush	3,754	3,956	407,799	1.05	109	1.6	5.5
Burn	4,081	2,481	410,311	.61	100	1.3	3.6
Subalpine	24	5	111	.21	5		
All Upland	56,114	59,060	8,615,749	1.05	154	2.0	5.7
Stream (Hand)	2,621	10,268	2,226,439	3.91	849	4.4	8.4
Stream (Slash)	55	1,072	54,434	19.49	990		
Stream (Machine)	171	488	85,500	2.85	500		
All Stream	2,847	11,828	2,366,373	4.15	831	4.4	8.4
All Types	58,961	70,888	10,982,122	1.20	186	2.4	6.2

TABLE NO. 3B - SECOND WORKING

Eradication Type	Acres Second Working	Effective Man Days	Total Ribes	Per Acre Basis		Ribes Remaining Per Acre	
				Man Days	Ribes	Bushes	Live Stem
Open Reproduction	154	182	17,584	1.18	114	7.8	11.3
Open Pole	174	315	21,327	1.81	122	3.6	13.1
Open Mature	790	921	85,835	1.16	109	3.3	8.5
Cut Over	364	292	54,716	.80	150	2.3	7.0
All Upland	1,482	1,710	179,462	1.15	121	3.5	9.0
Stream (Hand)	500	1,015	136,854	2.03	273	2.6	9.0
Stream (Slash)	13	503	3,797	38.69	292		
All Stream	513	1,518	140,651	2.96	274	2.6	9.0
All Types	1,995	3,228	320,113	1.62	160	3.4	9.0

TABLE NO. 4

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1935
COEUR D'ALENE OPERATION

Working	Class	Acres	Effective Man Days	Total Ribes	Per Acre Basis: Man Days	Per Acre Basis: Ribes	Ribes Remaining Per Acre: Bushes	Ribes Remaining Per Acre: Live Stem
First	EQ-ERA	4,476	3,721	411,787	.83	92	3.0	10.7
	FS-ERA	3,166	5,065	928,358	1.49	293	6.0	21.6
	FS-REG.	171	488	85,500	2.85	500		
	F-ECW	51,148	61,614	9,556,477	1.20	186	2.1	5.0
Second	F-ECW	1,995	3,228	320,113	1.48	147	3.4	9.0
All Workings	EQ-ERA	4,476	3,721	411,787	.83	92	3.0	10.7
	FS-ERA	3,166	5,065	928,358	1.49	293	6.0	21.6
	FS-REG.	171	488	85,500	2.85	500		
	F-ECW	53,143	64,842	9,876,590	1.21	185	2.2	5.2

TABLE NO. 5

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1935
COEUR D'ALENE OPERATION

Working	Number of Acres Worked by Ownership Classes: Federal	State - Idaho	Private	Total
First	57,420	142	1,399	58,961
Second	1,567		428	1,995
All Workings	58,987	142	1,827	60,956

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TABLE NO. 6

RESULTS OF CHECKING ON AREAS WORKED DURING 1935
COEUR D'ALENE OPERATION

	Average Results For All Areas												Areas With More Than 25 Feet Live Stem Per Acre		
			Ribes Per Acre											Per Acre	
			Ribes lacustre		Ribes viscosissimum		Ribes inerme		Ribes irriguum		All Species				
Eradication Type	Acres in Checked Area	Acres Checked	Bushes	Live Stem	Bushes	Live Stem	Bushes	Live Stem	Bushes	Live Stem	Bushes	Live Stem	Acres	Bushes	Live Stem
Open Reproduction	19,185	766	1.8	5.2	0.6	1.8					2.4	7.0	430	12.9	42.4
Dense Reproduction	521	20	2.8	5.9	0.2	0.7					3.0	6.6			
Open Pole	5,719	230	0.6	2.4	0.9	2.5					1.5	4.9	25	29.0	47.0
Dense Pole	5,460	218	0.2	0.6	0.3	1.5					0.5	2.1			
Open Mature	14,233	573	1.6	5.7	0.5	1.1			0.1	0.3	2.2	7.1	780	11.6	41.8
Dense Mature	2,156	85	0.8	1.4							0.8	1.4			
Cut Over	2,463	97	1.7	2.5	0.8	1.4					2.5	3.9			
Brush	3,754	149	0.8	2.6	0.8	2.9					1.6	5.5	77	12.3	48.7
Burn	4,081	163	0.9	2.1	0.4	1.5					1.3	3.6			
Subalpine	24	1													
All Upland	57,596	2,302	1.3	4.0	0.6	1.6			0.1	0.1	2.0	5.7	1,312	12.6	42.5
Stream (Hand)	3,121	570	3.1	6.9	0.1	0.1	1.0	1.5			4.2	8.5	275	15.0	45.6
Stream (Slash)	68														
Stream (Machine)	171														
All Types	60,956	2,872	1.7	4.6	0.5	1.3	0.2	0.3	0.1	0.1	2.5	6.3	1,587	13.2	43.2

TABLE NO. 7

TOTAL RIBES BY SPECIES ERADICATED, 1935
COEUR D'ALENE OPERATION

			Ribes by Species				
Working	Eradication Type	Acres	Ribes lacustre	Ribes viscosissimum	Ribes inerme	Ribes irriguum	Total Ribes
First	Open Reproduction	19,031	3,442,332	1,344,409	326,547	32,675	5,145,963
	Dense Reproduction	521	57,660	669			58,329
	Open Pole	5,545	179,252	316,294		27,653	523,199
	Dense Pole	5,460	188,049	68,409		1,288	257,746
	Open Mature	13,443	912,542	473,653	6,709	50,426	1,443,330
	Dense Mature	2,156	47,532	3,311	8,511	859	60,213
	Cut Over	2,099	243,410	49,899	9,012	6,427	308,748
	Brush	3,754	121,903	257,983	24,869	3,044	407,799
	Burn	4,081	271,251	120,106	13,530	5,424	410,311
	Subalpine	24	77	34			111
	All Upland	56,114	5,464,008	2,634,767	389,178	127,796	8,615,749
	Stream (Hand)	2,621	1,160,787	22,405	1,030,202	13,045	2,226,439
	Stream (Slash)	55	11,783		42,651		54,434
	Stream (Machine)	171	17,100		68,400		85,500
	All Stream	2,847	1,189,670	22,405	1,141,253	13,045	2,366,373
	All Types	58,961	6,653,678	2,657,172	1,530,431	140,841	10,982,122
Second	Open Reproduction	154	16,772	812			17,584
	Open Pole	174	14,911	6,416			21,327
	Open Mature	790	79,206	6,629			85,835
	Cut Over	364	36,302	18,414			54,716
	All Upland	1,482	147,191	32,271			179,462
	Stream (Hand)	500	67,025	2	69,827		136,854
	Stream (Slash)	13	918		2,879		3,797
	All Stream	513	67,943	2	72,706		140,651
	All Types	1,995	215,134	32,273	72,706		320,113
All Workings	Open Reproduction	19,185	3,459,104	1,345,221	326,547	32,675	5,163,547
	Dense Reproduction	521	57,660	669			58,329
	Open Pole	5,719	194,163	322,710		27,653	544,526
	Dense Pole	5,460	188,049	68,409		1,288	257,746
	Open Mature	14,233	991,748	480,282	6,709	50,426	1,529,165
	Dense Mature	2,156	47,532	3,311	8,511	859	60,213
	Cut Over	2,463	279,712	68,313	9,012	6,427	363,464
	Brush	3,754	121,903	257,983	24,869	3,044	407,799
	Burn	4,081	271,251	120,106	13,530	5,424	410,311
	Subalpine	24	77	34			111
	All Upland	57,596	5,611,199	2,667,038	389,178	127,796	8,795,211
	Stream (Hand)	3,121	1,240,513	22,407	1,145,559	13,045	2,421,524
	Stream (Slash)	68					
	Stream (Machine)	171	17,100		68,400		85,500
	All Stream	3,360	1,257,613	22,407	1,213,959	13,045	2,507,024
	All Types	60,956	6,868,812	2,689,445	1,603,137	140,841	11,302,235

SUMMARY OF RIBES ERADICATION, 1927-1935
COEUR D'ALENE OPERATION

TABLE NO. 8 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Total Effective Man Days	Total Ribes
Open Reproduction	45,203	2,887	89,810	12,664,203
Dense Reproduction	9,836	652	10,069	1,006,521
Open Pole	32,347	3,348	19,320	3,053,025
Dense Pole	14,786	195	4,051	569,433
Open Mature	113,223	6,292	78,790	12,864,214
Dense Mature	12,267	542	1,929	229,937
Cut Over	7,994	1,651	10,741	3,040,687
Brush	9,181	434	12,780	1,800,184
Burn	4,585		2,643	443,210
Subalpine	485		283	76,762
All Upland	249,907	16,001	230,416	35,748,176
Stream (Hand)	11,557	1,579	46,269	10,036,706
Stream (Slash)	78	13	1,792	68,731
Stream (Machine)	479		1,964	239,500
All Stream	12,114	1,592	50,025	10,344,937
All Types	262,021	17,593	280,441	46,093,113

TABLE NO. 8A - FIRST WORKING

Eradication Type	Acres First Working	Effective Man Days	Total Ribes	Per Acre Basis	
				Man Days	Ribes
Open Reproduction	45,203	84,139	12,107,745	1.86	268
Dense Reproduction	9,836	9,445	928,583	.96	94
Open Pole	32,347	17,308	2,664,065	.54	82
Dense Pole	14,786	3,983	563,657	.27	38
Open Mature	113,223	74,420	12,026,644	.66	106
Dense Mature	12,267	1,625	193,102	.13	16
Cut Over	7,994	8,864	2,713,580	1.11	339
Brush	9,181	12,196	1,716,171	1.33	187
Burn	4,585	2,643	443,210	.58	97
Subalpine	485	283	76,762	.58	158
All Upland	249,907	214,906	33,433,519	.86	134
Stream (Hand)	11,557	42,239	9,587,875	3.65	830
Stream (Slash)	78	1,340	64,934	17.18	832
Stream (Machine)	479	1,964	239,500	4.10	500
All Stream	12,114	45,543	9,892,309	3.76	817
All Types	262,021	260,449	43,325,828	.99	165

TABLE NO. 8B - SECOND WORKING

Eradication Type	Acres Second Working	Effective Man Days	Total Ribes	Per Acre Basis	
				Man Days	Ribes
Open Reproduction	2,887	5,671	556,458	1.96	193
Dense Reproduction	652	624	77,938	.96	120
Open Pole	3,348	2,012	388,960	.60	116
Dense Pole	195	68	5,776	.35	30
Open Mature	6,292	4,370	837,570	.69	133
Dense Mature	542	304	36,835	.56	68
Cut Over	1,651	1,877	327,107	1.14	198
Brush	434	584	84,013	1.35	194
All Upland	16,001	15,510	2,314,657	.97	145
Stream (Hand)	1,579	4,030	448,834	2.55	284
Stream (Slash)	13	452	3,794	34.77	292
All Stream	1,592	4,482	452,628	2.82	284
All Types	17,593	19,992	2,767,285	1.14	157

TABLE NO. 9

TOTAL RIBES BY SPECIES ERADICATED, 1927-1935
COEUR D'ALENE OPERATION

Working	Eradication Type	Acres	Ribes by Species				Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes inerme	Ribes irriguum	
First	Open Reproduction	45,203	7,593,037	3,962,012	485,561	67,135	12,107,745
	Dense Reproduction	9,836	602,795	318,766	5,323	1,699	928,583
	Open Pole	32,347	1,556,251	1,068,163	6,453	33,198	2,664,065
	Dense Pole	14,786	428,567	130,061	3,741	1,288	563,657
	Open Mature	113,223	9,434,096	2,384,357	65,243	142,948	12,026,644
	Dense Mature	12,267	165,773	16,692	9,778	859	193,102
	Cut Over	7,994	2,023,058	668,277	15,818	6,427	2,713,580
	Brush	9,181	652,803	1,033,034	25,748	4,586	1,716,171
	Burn	4,585	294,349	129,907	13,530	5,424	443,210
	Subalpine	485	55,561	21,201			76,762
	All Upland	249,907	22,806,290	9,732,470	631,195	263,564	33,433,519
	Stream (Hand)	11,557	6,006,061	127,304	3,482,747	36,697	9,652,809
	Stream (Slash)	78					
	Stream (Machine)	479	47,900		191,600		239,500
	All Stream	12,114	6,053,961	127,304	3,674,347	36,697	9,892,309
	All Types	262,021	28,860,251	9,859,774	4,305,542	300,261	43,325,828
Second	Open Reproduction	2,887	294,323	251,441	10,655	39	556,458
	Dense Reproduction	652	72,285	5,642	11		77,938
	Open Pole	3,348	306,249	78,829	3,882		388,960
	Dense Pole	195	5,509	267			5,776
	Open Mature	6,292	567,925	257,174	11,065	1,406	837,570
	Dense Mature	542	36,053	782			36,835
	Cut Over	1,651	253,133	63,523	10,451		327,107
	Brush	434	8,477	75,536			84,013
	All Upland	16,001	1,543,954	733,194	36,064	1,445	2,314,657
	Stream (Hand)	1,579	269,198	34,852	148,578		452,628
	Stream (Slash)	13					
	All Stream	1,592	269,198	34,852	148,578		452,628
	All Types	17,593	1,813,152	768,046	184,642	1,445	2,767,285
All Workings	Open Reproduction	48,090	7,887,360	4,213,453	496,216	67,174	12,664,203
	Dense Reproduction	10,488	675,080	324,408	5,334	1,699	1,006,521
	Open Pole	35,695	1,862,500	1,146,992	10,335	33,198	3,053,025
	Dense Pole	14,981	434,076	130,328	3,741	1,288	569,433
	Open Mature	119,515	10,002,021	2,641,531	76,308	144,354	12,864,214
	Dense Mature	12,809	201,826	17,474	9,778	859	229,937
	Cut Over	9,645	2,276,191	731,800	26,269	6,427	3,040,687
	Brush	9,615	661,280	1,108,570	25,748	4,586	1,800,184
	Burn	4,585	294,349	129,907	13,530	5,424	443,210
	Subalpine	485	55,561	21,201			76,762
	All Upland	265,908	24,350,244	10,465,664	667,259	265,009	35,748,176
	Stream (Hand)	13,136	6,275,259	162,156	3,631,325	36,697	10,105,437
	Stream (Slash)	91					
	Stream (Machine)	479	47,900		191,600		239,500
	All Stream	13,706	6,323,159	162,156	3,822,925	36,697	10,344,937
	All Types	279,614	30,673,403	10,627,820	4,490,184	301,706	46,093,113

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TABLE NO. 10

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1927-1935
COEUR D'ALENE OPERATION

Working	Number of Acres Worked by Ownership Classes			Total
	Federal	State - Idaho	Private	
First	250,995	3,272	7,754	262,021
Second	16,288	60	1,245	17,593
All Workings	267,283	3,332	8,999	279,614

TABLE NO. 11

PROGRESS OF FIRST WORKING BY OWNERSHIP CLASSES, 1927-1935
COEUR D'ALENE OPERATION

Ownership Class	Number of Acres		
	Worked	Unworked	Total
Federal	250,995	51,989	302,984
State - Idaho	3,272	2,138	5,410
Private	7,754	8,175	15,929
Total	262,021	62,302	324,323

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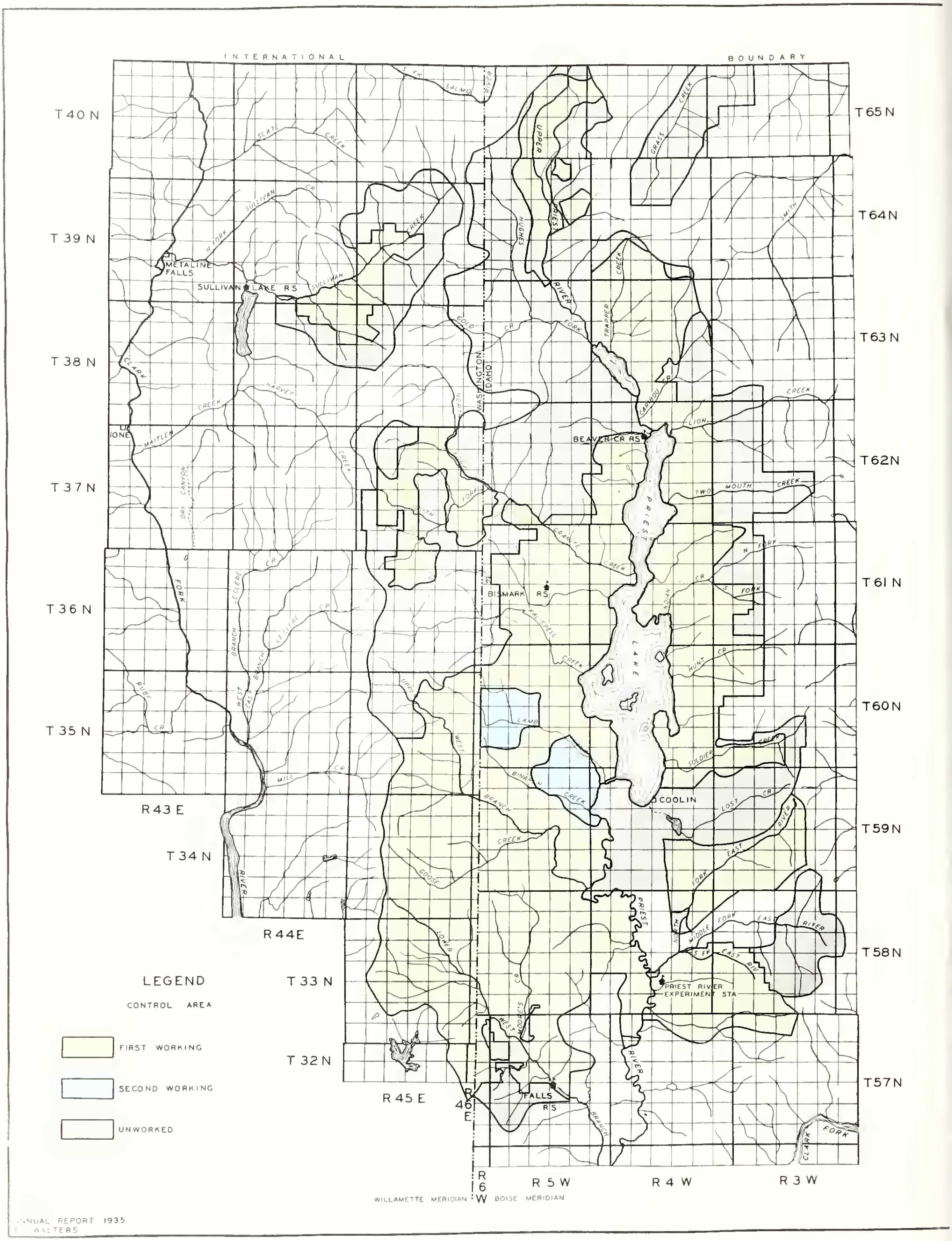

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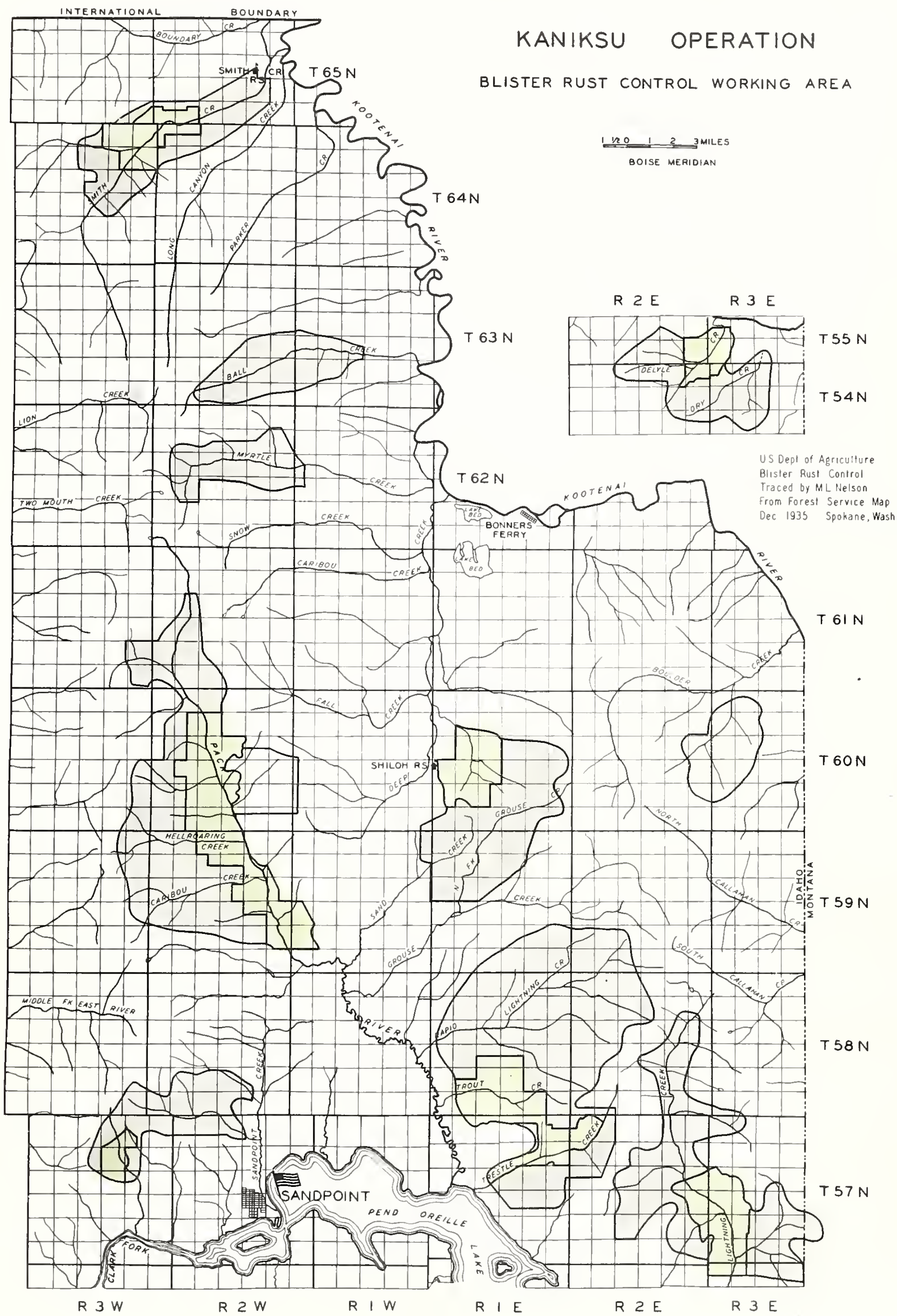
WALTERS


KANIKSU OPERATION
BLISTER RUST CONTROL WORKING AREA
1 1/2 0 1 2 3 MILES
BOISE MERIDIAN
US Dept of Agriculture
Blister Rust Control
Traced by M.L. Nelson
From Forest Service Map
Dec 1935 Spokane, Wash
INTERNATIONAL BOUNDARY
T 65 N
T 64 N
T 63 N
T 62 N
T 61 N
T 60 N
T 59 N
T 58 N
T 57 N
T 55 N
T 54 N
R 3 W
R 2 W
R 1 W
R 1 E
R 2 E
R 3 E
KOOTENAI RIVER
BONNERS FERRY
SHILOH RS
SANDPOINT
PEND OREILLE LAKE
CLARK FORK
IDAHO
MONTANA

RIBES ERADICATION, KANIKSU OPERATION, 1935

by

Frank O. Walters

Associate Pathologist

INTRODUCTION

The Kaniksu operation includes the old Kaniksu and Pend Oreille National Forests which have been combined and are now known as the Kaniksu National Forest, the Priest Lake and Pend Oreille Timber Protective Associations.

During the 1935 field season blister rust control work was conducted on both the Kaniksu and Pend Oreille divisions. The program consisted of six camps financed by allotments to the Bureau of Entomology and Plant Quarantine under the Emergency Relief Act, four camps financed by allotments to the Forest Service under the Emergency Relief Act, one bulldozer camp financed by regular appropriation to the Forest Service for blister rust control work, two camps operated on a cooperative basis by the Bureau of Entomology and Plant Quarantine and the State of Idaho under which the state paid all wages and the Bureau furnished equipment and supplies. In addition one ECW camp was engaged on blister rust control work entirely and nine ECW camps assigned from 20 to 120 workers for this work.

ECW work was started about June 1 and terminated October 10, ERA work started August 1 and terminated October 24, work by the state cooperative camps started June 20 and terminated October 12.

LOCATION AND DESCRIPTION OF AREAS

On the Kaniksu division of the forest, work was carried on in the Sullivan Creek drainage by ECW workers. The area consisted largely of open pole, open mature and dense reproduction types. The terrain was steep and rugged and represented slow and difficult working conditions. 1,300 acres of stream type in the Priest River Valley were given a second working by ECW workers.

The state cooperative camps worked a large block of state land on the east side of Priest Lake. This area consisted largely of excellent stands of mature white pine and white pine reproduction. Working conditions were generally light.

On the Pend Oreille division of the forest, work was done with ECW and ERA workers. In the Pack River drainage, work was carried on with ERA labor hired by the Bureau of Entomology and Plant Quarantine. Open reproduction was the principal timber type and average working conditions were encountered. Twin Creek, Trestle Creek and Trout Creek drainages were areas on which work was carried on with ERA labor hired by the Forest Service. These areas consisted largely of reproduction and pole timber types. Average working conditions were encountered. ECW labor worked areas in Lightning, Trail and Smith Creek drainages, in which pole and mature stands predominated. Working conditions were severe in the Lightning Creek drainage due largely to the extreme steepness of the country. In Smith and Trail Creek drainages, working conditions were

A1098

A1099

W1569

Aerial photographs showing results of bulldozer work and agricultural possibilities on cleared areas. The top picture shows an area shortly after completion of bulldozer work. The year following burning the area was planted to oats which grew so rank where brush piles had been burned that partial lodging took place as the middle picture shows. The bottom picture taken from the ground is a close-up of the oats showing them to be shoulder high to a man standing in the oat field. Aerial photographs official pictures 116th Photo Section, Washington National Guard.

generally light.

Bulldozer work was carried on in the Upper West Branch where several unusual problems made working conditions difficult.

Among the areas protected this year, infection either on pine or Ribes was found in the following localities: Sullivan Creek, Priest River Valley, generally scattered on the east side of Priest Lake, Pack River and Trout Creek.

ORGANIZATION AND ADMINISTRATION

The forest office at Sandpoint, Idaho served as an administrative headquarters for the operation.

Subsistence supplies for the individual camps were ordered directly from central purchase in Spokane, Washington and direct delivery was then made to camps.

The operation was organized on a cooperative basis similar to the 1934 organization, in which a forest officer and a representative of the Bureau of Entomology and Plant Quarantine jointly supervised the program. See organization chart.

The caliber of this year's ECW workers was distinctly below that of last year. The men were recruited mostly from the large eastern cities and were slow and often unwilling to adapt themselves to woods work.

The ERA personnel was of the poorest type of labor. Only about 50 percent of the men were capable of even average accomplishment.

METHODS AND EQUIPMENT

A training school was held prior to the ECW field season. Camp superintendents, foremen and checkers were instructed in field methods and general procedure in making maps and keeping records.

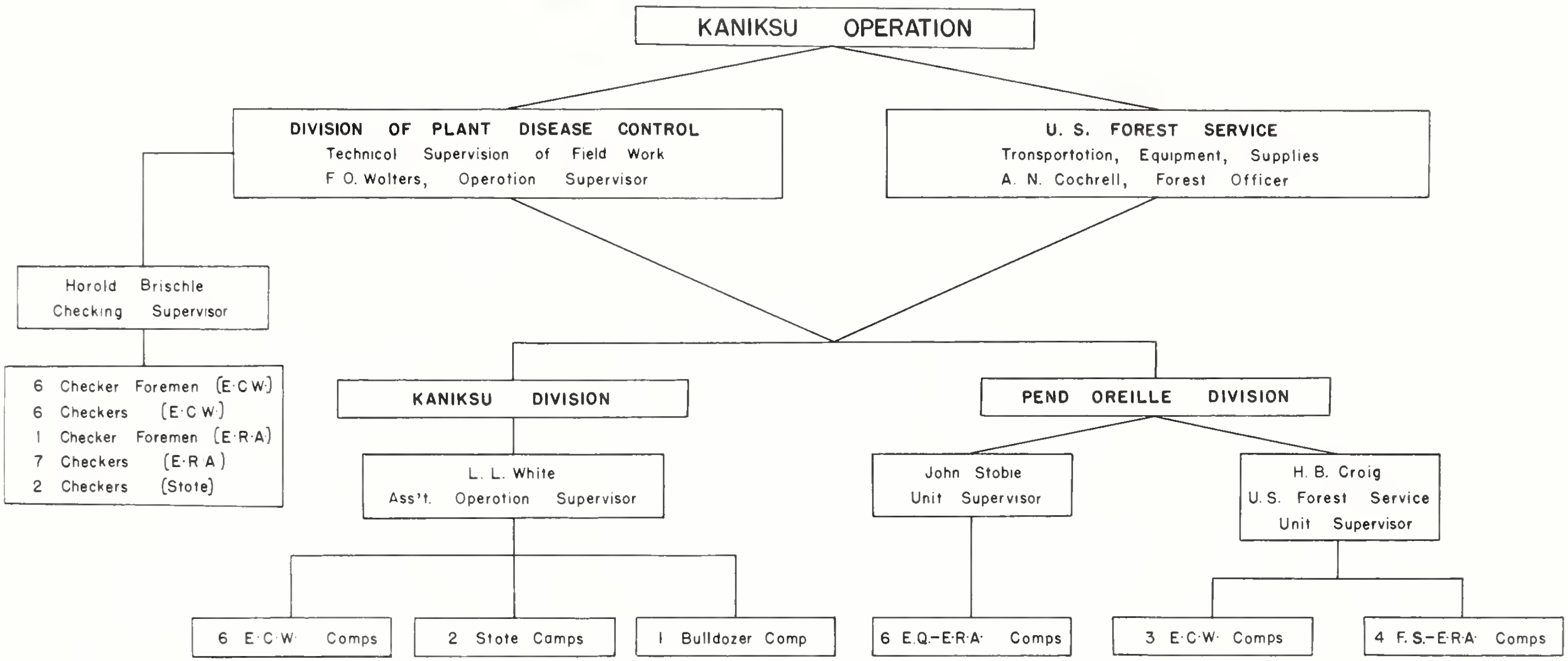
Due to the late start of the ERA program there was no time in which to hold a training school for the supervisory personnel. This proved to be a distinct handicap in starting the work.

Three methods of Ribes eradication were used, hand pulling, decapitation and bulldozer.

The regular 3-man crew was used as much as possible but better results were obtained with the poorer types of ERA and ECW labor when larger crews were used and constant supervision given the men.

Decapitation methods developed by the chemical investigation project were used in the field for the first time. This method was used very effectively on brushy and rocky areas, and on areas where there was a number of windfalls. In this method the Ribes bush is cut off through the crown and an application of chemical made to prevent any resprouting. Bushes that cannot be pulled by

ORGANIZATION CHART



E·C·W·
Number of Comps – 9
1 – 100 % Comp
1 – 80 % Comp
1 – 50 % Comp
4 – 20 % Comps
2 – 40 % Comps
Number of Men on
Blister Rust Work – 625

STATE COOPERATIVE
2 32 – mon Comps
Number of Men on
Blister Rust Work – 64

FOREST SERVICE REGULAR
1 15 – mon Bulldozer Comp
Number of Men on
Blister Rust Work – 15

E·R·A·
Number of Comps – 10
6 64 – man Camps
2 50 – mon Comps
2 25 – mon Camps
Number of Men on
Blister Rust Work – 544

Totol Number of Men on Blister Rust Work – 1248

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hand either because of size or because the roots are imbedded firmly in rock crevices or under windfalls or intertwined with roots of other brush can be readily eradicated by the decapitation method.

When stream type conditions were extremely difficult and hand methods impractical, a bulldozer was used to remove and pile the brush. After the brush was burned in the fall, the area was planted to grass. 855 ECW man days were expended this year burning brush left from last year's bulldozer operation.

CHECKING

The checking organization functioned as an integral part of the blister rust control program and cooperated in every way possible with the eradication forces.

An advance survey was run by the checkers as soon as possible after camps were established. This survey served to establish type boundaries and show Ribes distribution. Parallel check strips were run in a cardinal direction at 10-chain intervals. On areas showing relatively few Ribes additional strips were run bringing the interval between strips down to 5 chains. From this survey a clear picture of Ribes distribution was shown and eradication crews confined their work to areas on which Ribes were present while areas sufficiently low in Ribes population and live stem were eliminated from crew work.

Figures and maps were prepared in the field showing the final condition of all areas claimed by the eradication forces on the basis of a 4 percent sample check on upland areas and an 8 percent check on stream type.

The ECW checking forces checked 20,556 acres at a cost of $.154 per acre while checkers in State and ERA camps checked 16,768 and 22,769 acres at costs of $.074 and $.118 respectively. The combined cost of checking for the project was $.116 per acre.

The caliber of personnel used on eradication work in both ECW and ERA camps was poorer than that of last year. A great amount of rechecking was done which explains the higher costs in these camps in contrast with the cost in the State camps where more efficient eradication work was done on the first working of the ground.

PREERADICATION AND SURVEYS

By utilizing a small amount of unexpended NIRA funds an advance check was made on an area of approximately 19,000 acres during the early part of the season. A 2 percent check was made on all areas; areas which appeared to be Ribes-free were given a 4 percent. This advance survey proved of great value in placing the ERA camps in the Pack River drainage in order to block in an area of some 13,000 acres in a solid unit.

On the basis of a rapid late season disease survey on Ribes viscosissimum, inspections made at 19 different points showed that an average of 7 to 9 percent of the bushes examined were infected with blister rust. Since this survey was


W1560


W1565


W1561

Pictures showing the appearance of areas before and after the bulldozing operation. The top picture illustrates the heavy brush conditions of the areas on which the bulldozer operates. The middle picture illustrates the dense masses of Ribes inerme existing on these areas. The bottom picture shows the cleared area with the brush and Ribes piled ready for burning.

made late in the season after considerable defoliation had taken place on the Ribes, it is probable that there was more blister rust infection present than was found on this late season survey. However, the results show that blister rust infection on *R. viscosissimum* is generally distributed over the entire forest.

STATEMENT OF EXPENDITURES AND COSTS

The statement of expenditures and costs includes those funds expended from appropriations directly allotted to the Bureau of Entomology and Plant Quarantine, the United States Forest Service, and funds turned over to the Bureau of Entomology and Plant Quarantine by the State of Idaho for use in Ribes eradication on state lands. The direct appropriations to the Bureau of Entomology and Plant Quarantine and the United States Forest Service were those allotted under NIRA, the Emergency Relief Act, and the regular appropriations for blister rust control work.

No complete costs are available for ECW work except those incurred by the Bureau of Entomology and Plant Quarantine in the course of providing technical supervision to ECW work.

Effective man days in the following tabulations represent eight hours of work in the field by men actually engaged in the eradication of Ribes.

On account of the late season start of the ERA work and the maintenance of the camps in the field later than the normal operating season, the number of effective man days under this program for the 1935 season is considerably lower in relation to costs than it would be in the case of a full season of work. Consequently, the cost per effective man day is higher than it would be under normal conditions.

TABLE NO. 1

EXPENDITURES BY APPROPRIATIONS, CALENDAR YEAR 1935
KANIKSU OPERATION

Cooperating Agency	Appropriation	Amount
	Nonnira	16,6[illegible]7.94
	Regular	7,995.04
	ERA	19,37[illegible].06
Forest Service	Total	4[illegible],[illegible]1.05
	NIRA - Idaho	9,0[illegible].75
	NIRA - Washington	8,516.92
	Regular - Idaho	[illegible],37[illegible].84
	Regular - Washington	24[illegible].67
Bureau of Entomology	ERA - Idaho	62,90[illegible].25
and Plant Quarantine	Total	83,061.49
State of Idaho	State of Idaho	14,110.01
Total Expenditures	All Appropriations	$141,15[illegible].55

TABLE NO. 2

CLASSIFIED EXPENDITURES, CALENDAR YEAR 1935
KANIKSU OPERATION

Item	Forest Service				Bureau of Entomology and Plant Quarantine				State of Idaho	Total
	NIRA	Regular	ERA	Total	NIRA	Regular	ERA	Total		
Salaries Permanent Men		$ 250.97		$ 250.97	$ 4,482.32	$2,384.67	$ 1,848.84	$ 8,715.83		$ 8,966.80
Salaries Temp. App't. Men			$ 547.48	547.48	996.19		6,277.67	7,273.86		7,821.34
Wages, Temp. Laborers	$3,181.58	5,000.37	23,983.70	32,165.65	3,538.53	20.30	30,880.38	34,439.21	$14,110.01	80,714.87
Subsistence Supplies	633.66	860.18	3,776.60	5,270.44	1,506.32	9.84	10,239.61	11,755.77		17,026.21
Equipment	1,978.22	44.63	31.98	2,054.83	415.91		9,025.52	9,441.43		11,496.26
Trucks	493.05			493.05			656.52	656.52		1,149.57
Travel and Transportation	104.71	99.87	609.38	813.96	783.89	171.93	1,677.40	2,633.22		3,447.18
Chemicals							21.12	21.12		21.12
Twine					4,224.30			4,224.30		4,224.30
Other Supplies and Expenses	216.71	1,739.02	428.92	2,384.65	1,596.27	30.77	2,273.19	3,900.23		6,284.88
Total	$6,607.93	$7,995.04	$29,378.06	$43,981.03	$17,543.73	$2,617.51	$62,900.25	$83,061.49	$14,110.01	$141,152.53
Less 2/3 Cost New Equipment	1,648.93			1,648.93	277.27		6,646.20	6,923.47		8,572.40
Less Cost of Unused Sup.	59.86		275.21	335.07	3,800.00			3,800.00		4,135.07
Plus 1/3 Cost Old Equipment					4,070.14			4,070.14		4,070.14
Plus Cost of Sup. on Hand			442.50	442.50						442.50
Plus Bulldozer Depreciation	1,541.11			1,541.11						1,541.11
Net Cost of 1935 Operation	$6,440.25	$7,995.04	$29,545.35	$43,980.64	$17,536.60	$2,617.51	$56,254.05	$76,408.16	$14,110.01	$134,498.81

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In arriving at effective 8-hour man day costs for work by the various classes of camps, it is difficult to prorate costs incurred by the use of funds for financing training schools, pre-season surveys and other activities incidental to starting the field work.

Activity	Effective Man Day Cost	Total Net Cost
EQ - ERA	$ 7.12	$ 61,624.59
FS - ERA	6.29	37,249.33
FS - Reg. (Bulldozer Camp)	11.37	9,694.52
State Coop.	6.37	19,415.78
Contributed in cooperation with ECW work		6,514.56
Total net cost of 1935 operation		$134,49[illegible].91

Additional Information:

Average cost per meal $.156

Note: The ERA net cost of wages as reported for 1934 for the Forest Service work should be reduced in the amount of $4,302.00 due to an overcharge on commissary supplies. This adjustment has not been made in the costs of the 1935 operation.

SUMMARY OF RIBES ERADICATION, 1935
KANIKSU OPERATION

TABLE NO. 3 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Total Effective Man Days	Total Ribes	Ribes Remaining Per Acre	
					Bushes	Live Stem
Open Reproduction	17,330	19	13,124	2,302,207	2.0	7.8
Dense Reproduction	3,718	42	2,621	344,553	1.8	5.4
Open Pole	14,714	35	6,989	660,511	1.7	7.1
Dense Pole	1,828		572	60,271	.9	3.5
Open Mature	13,878	29	2,942	400,270	1.4	5.0
Dense Mature	3,737		39	2,145	.3	1.7
Brush	690	34	80	10,632	.7	2.4
Subalpine	375				1.0	2.3
Meadow-Field	60				.0	.0
All Upland	56,330	159	26,367	3,780,589	1.5	6.1
Stream (Hand)	2,414	1,300	9,341	1,267,447	6.5	10.0
Stream (Machine)	183		853	91,500		
All Stream	2,597	1,300	10,194	1,358,947	6.5	10.0
All Types	58,927	1,459	36,561	5,139,536	2.6	7.0

TABLE NO. 3A - FIRST WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Per Acre Basis		Ribes Remaining Per Acre	
				Man Days	Ribes	Bushes	Live Stem
Open Reproduction	17,330	13,099	2,300,257	.76	133	2.0	7.9
Dense Reproduction	3,718	2,551	341,379	.69	92	1.8	5.4
Open Pole	14,714	6,941	658,051	.47	45	1.6	7.1
Dense Pole	1,828	572	60,271	.31	33	.9	3.5
Open Mature	13,878	2,897	399,000	.21	29	1.4	5.0
Dense Mature	3,737	39	2,145	.01	1	.3	1.7
Brush	690	43	9,163	.06	13	.6	1.9
Subalpine	375					1.0	2.3
Meadow-Field	60						
All Upland	56,330	26,142	3,770,266	.46	67	1.6	6.1
Stream (Hand)	2,414	5,942	1,110,636	2.46	460	3.6	9.7
Stream (Machine)	183	853	91,500	4.66	500		
All Stream	2,597	6,795	1,202,136	2.62	463	3.6	9.7
All Types	58,927	32,937	4,972,402	.56	84	2.0	6.8

TABLE NO. 3B - SECOND WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Per Acre Basis		Ribes Remaining Per Acre	
				Man Days	Ribes	Bushes	Live Stem
Open Reproduction	19	25	1,950	1.32	103	1.0	1.0
Dense Reproduction	42	70	3,174	1.67	76	1.5	7.0
Open Pole	35	48	2,460	1.37	70	1.3	4.7
Open Mature	29	45	1,270	1.55	44	2.0	6.0
Brush	34	37	1,469	1.09	43	3.0	17.0
All Upland	159	225	10,323	1.42	65	1.6	6.6
Stream (Hand)	1,300	3,399	156,811	2.61	121	19.2	11.9
All Stream	1,300	3,399	156,811	2.61	121	19.2	11.9
All Types	1,459	3,624	167,134	2.48	115	17.8	11.5

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TABLE NO. 4

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1935
KANIKSU OPERATION

Working	Class	Acres	Effective Man Days	Total Ribes	Per Acre Basis: Man Days	Per Acre Basis: Ribes	Ribes Remaining Per Acre: Bushes	Ribes Remaining Per Acre: Live Stem
First	EQ-ERA	13,250	8,643	1,269,641	.65	96	1.7	7.0
	FS-ERA	9,519	5,922	1,025,638	.62	108	2.5	7.6
	FS-Reg.	183	853	91,500	4.66	500		
	State Coop.	16,768	3,048	593,078	.18	35	.9	3.8
	F-ECW	19,095	13,723	1,783,189	.72	93	2.9	9.7
	S&P-ECW	112	748	209,356	6.68	1,869		
Second	F-ECW	1,459	3,624	167,134	2.48	115	17.6	11.4
All Workings	EQ-ERA	13,250	8,643	1,269,641	.65	96	1.7	7.0
	FS-ERA	9,519	5,922	1,025,638	.62	108	2.5	7.6
	FS-Reg.	183	853	91,500	4.66	500		
	State Coop.	16,768	3,048	593,078	.18	35	.9	3.8
	F-ECW	20,554	17,347	1,950,323	.84	95	4.4	9.0
	S&P-ECW	112	748	209,356	6.68	1,869		

TABLE NO. 5

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1935
KANIKSU OPERATION

Working	Number of Acres Worked by Ownership Classes: Federal	State - Idaho	Private	Total
First	23,953	13,748	21,226	58,927
Second	362	19	1,078	1,459
All Workings	24,315	13,767	22,304	60,386

TABLE NO. 6

RESULTS OF CHECKING ON AREAS WORKED DURING 1935
KANIKSU OPERATION

Eradication Type	Average Results for All Areas: Acres in Checked Area	Acres Checked	Ribes Per Acre: Ribes lecustre Bushes	Ribes lecustre Live Stem	Ribes viscosissimum Bushes	Ribes viscosissimum Live Stem	Ribes inerme Bushes	Ribes inerme Live Stem	Ribes acerifolium Bushes	Ribes acerifolium Live Stem	All Species Bushes	All Species Live Stem	Areas With More Than 25 Feet Live Stem Per Acre: Acres	Per Acre: Bushes	Per Acre: Live Stem
Open Reproduction	17,239	699	.6	2.3	1.4	5.5					2.0	7.8	907	11.3	48.5
Dense Reproduction	3,760	154	1.2	3.3	.6	2.1					1.8	5.4			
Open Pole	14,749	590	.8	3.8	.9	3.3					1.7	7.1	507	10.2	54.2
Dense Pole	1,828	75	.9	3.5							.9	3.5			
Open Mature	13,907	556	1.2	4.3	.2	.7					1.4	5.0			
Dense Mature	3,737	145	.3	1.7							.3	1.7			
Brush	724	27	.7	2.4							.7	2.4			
Subalpine	375	15	1.0	2.3							1.0	2.3			
Meadow-Field	60	2													
All Upland	56,379	2,263	.8	3.2	.7	2.9					1.5	6.1	1,414	10.7	50.6
Stream	3,714	633	3.2	7.8	.1	.1	3.1	2.0	.1	.1	6.5	10.0	61	12.9	49.2
All Types	60,093	2,896	1.3	4.2	.6	2.3	.7	.4	.1	.1	2.7	7.0	1,475	10.8	50.5

TABLE NO. 7

TOTAL RIBES BY SPECIES ERADICATED, 1935
KANIKSU OPERATION

Working	Eradication Type	Acres	Ribes by Species					Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes inerme	Ribes irriguum	Ribes acerifolium	
First	Open Reproduction	17,330	732,020	1,559,217	6,073	2,947		2,300,257
	Dense Reproduction	3,718	273,991	62,258	5,130			341,379
	Open Pole	14,714	354,602	274,996	3,413	21,192	3,848	658,051
	Dense Pole	1,828	51,659	8,090		522		60,271
	Open Mature	13,878	313,063	85,256	12		669	399,000
	Dense Mature	3,737	1,042	1,103				2,145
	Brush	690	350	8,813				9,163
	Meadow-Field	60						
	Subalpine	375						
	All Upland	56,330	1,726,727	1,999,733	14,628	24,661	4,517	3,770,266
	Stream (Hand)	2,414	950,081	28,781	112,190		19,584	1,110,636
	Stream (Machine)	183	18,300		73,200			91,500
	All Stream	2,597	968,381	28,781	185,390		19,584	1,202,136
	All Types	58,927	2,695,108	2,028,514	200,018	24,661	24,101	4,972,402
Second	Open Reproduction	19	800	300	850			1,950
	Dense Reproduction	42	1,350	423	1,401			3,174
	Open Pole	35	1,270		1,190			2,460
	Open Mature	29	600		670			1,270
	Brush	34	630		839			1,469
	All Upland	159	4,650	723	4,950			10,323
	Stream (Hand)	1,300	34,915	245	121,651			156,811
	All Stream	1,300	34,915	245	121,651			156,811
	All Types	1,459	39,565	968	126,601			167,134
All Workings	Open Reproduction	17,349	732,820	1,559,517	6,923	2,947		2,302,207
	Dense Reproduction	3,760	275,341	62,681	6,531			344,553
	Open Pole	14,749	355,872	274,996	4,603	21,192	3,848	660,511
	Dense Pole	1,828	51,659	8,090		522		60,271
	Open Mature	13,907	313,663	85,256	682		669	400,270
	Dense Mature	3,737	1,042	1,103				2,145
	Brush	724	980	8,813	839			10,632
	Meadow-Field	60						
	Subalpine	375						
	All Upland	56,489	1,731,377	2,000,456	19,578	24,661	4,517	3,780,589
	Stream (Hand)	3,714	984,996	29,026	233,841		19,584	1,267,447
	Stream (Machine)	183	18,300		73,200			91,500
	All Stream	3,897	1,003,296	29,026	307,041		19,584	1,358,947
	All Types	60,386	2,734,673	2,029,482	326,619	24,661	24,101	5,139,536

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SUMMARY OF RIBES ERADICATION, 1923-1935
KANIKSU OPERATION

TABLE NO. 8 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Total Effective Man Days	Total Ribes
Open Reproduction	83,671	834	41,314	12,634,606
Dense Reproduction	18,381	632	8,171	1,224,233
Open Pole	66,606	5,670	20,142	3,117,754
Dense Pole	17,384	1,033	3,239	355,168
Open Mature	74,490	176	18,027	4,050,040
Dense Mature	27,504		3,142	364,146
Cut Over	5,045		1,523	473,722
Brush	3,599	34	1,141	337,576
Burn	1,132		1,354	947,874
Subalpine	645		93	29,536
Meadow-Field	60			
All Upland	298,517	8,379	98,146	23,534,655
Stream (Hand)	13,724	1,624	28,594	6,607,311
Stream (Slash)	556		4,797	278,000
Stream (Machine)	426		2,003	213,000
All Stream	14,706	1,624	35,394	7,098,311
All Types	313,223	10,003	133,540	30,632,966

TABLE NO. 8A - FIRST WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Per Acre Basis Man Days	Per Acre Basis Ribes
Open Reproduction	83,671	41,120	12,621,026	.49	151
Dense Reproduction	18,381	8,021	1,212,191	.44	66
Open Pole	66,606	18,978	3,037,554	.28	46
Dense Pole	17,384	3,036	336,035	.17	19
Open Mature	74,490	17,945	4,041,348	.24	54
Dense Mature	27,504	3,142	364,146	.11	13
Cut Over	5,045	1,523	473,722	.30	94
Brush	3,599	1,104	336,107	.31	93
Burn	1,132	1,354	947,874	1.20	837
Subalpine	645	93	29,536	.14	46
Meadow-Field	60				
All Upland	298,517	96,316	23,399,539	.32	78
Stream (Hand)	13,724	24,749	6,282,635	1.80	458
Stream (Slash)	556	4,797	278,000	8.63	500
Stream (Machine)	426	2,003	213,000	4.70	500
All Stream	14,706	31,549	6,773,635	2.15	461
All Types	313,223	127,865	30,173,174	.41	96

TABLE NO. 8B - SECOND WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Per Acre Basis Man Days	Per Acre Basis Ribes
Open Reproduction	834	194	13,580	.23	16
Dense Reproduction	632	150	12,042	.24	19
Open Pole	5,670	1,164	80,200	.21	14
Dense Pole	1,033	203	19,133	.20	19
Open Mature	176	82	8,692	.47	49
Brush	34	37	1,469	1.09	43
All Upland	8,379	1,830	135,116	.22	16
Stream (Hand)	1,624	3,845	324,676	2.37	200
All Stream	1,624	3,845	324,676	2.37	200
All Types	10,003	5,675	459,792	.57	46

TABLE NO. 9

TOTAL RIBES BY SPECIES ERADICATED 1923-1935
KANIKSU OPERATION

Working	Eradication Type	Acres	Ribes by Species: Ribes lacustre	Ribes viscosissimum	Ribes inerme	Ribes irriguum	Ribes acerifolium	Total Ribes
First	Open Reproduction	83,671	3,951,739	8,527,320	139,020	2,947		12,621,026
	Dense Reproduction	18,381	871,484	308,222	32,485			1,212,191
	Open Pole	66,606	1,526,049	1,305,637	180,828	21,192	3,848	3,037,554
	Dense Pole	17,384	225,185	87,940	22,388	522		336,035
	Open Mature	74,490	2,793,507	1,133,672	113,500		669	4,041,348
	Dense Mature	27,504	263,908	68,499	31,739			364,146
	Cut Over	5,045	190,897	239,879	42,946			473,722
	Brush	3,599	68,387	203,158	64,562			336,107
	Burn	1,132	153,516	790,402	3,956			947,874
	Subalpine	645	18,206	11,311	19			29,536
	Meadow-Field	60						
	All Upland	298,517	10,062,878	12,676,040	631,443	24,661	4,517	23,399,539
	Stream (Hand)	13,724	3,235,679	246,759	2,780,613		19,584	6,282,635
	Stream (Slash)	556	55,600		222,400			278,000
	Stream (Machine)	426	42,600		170,400			213,000
	All Stream	14,706	3,333,879	246,759	3,173,413		19,584	6,773,635
	All Types	313,223	13,396,757	12,922,799	3,804,856	24,661	24,101	30,173,174
Second	Open Reproduction	834	11,352	886	1,342			13,580
	Dense Reproduction	632	9,905	619	1,518			12,042
	Open Pole	5,670	53,776	20,545	5,879			80,200
	Dense Pole	1,033	16,686	261	2,186			19,133
	Open Mature	176	7,949	10	733			8,692
	Brush	34	630		839			1,469
	All Upland	8,379	100,298	22,321	12,497			135,116
	Stream (Hand)	1,624	58,877	1,382	264,417			324,676
	All Stream	1,624	58,877	1,382	264,417			324,676
	All Types	10,003	159,175	23,703	276,914			459,792
All Workings	Open Reproduction	84,505	3,963,091	8,528,206	140,362	2,947		12,634,606
	Dense Reproduction	19,013	881,389	308,841	34,003			1,224,233
	Open Pole	72,276	1,579,825	1,326,182	186,707	21,192	3,848	3,117,754
	Dense Pole	18,417	241,871	88,201	24,574	522		355,168
	Open Mature	74,666	2,801,456	1,133,682	114,233		669	4,050,040
	Dense Mature	27,504	263,908	68,499	31,739			364,146
	Cut Over	5,045	190,897	239,879	42,946			473,722
	Brush	3,633	69,017	203,158	65,401			337,576
	Burn	1,132	153,516	790,402	3,956			947,874
	Subalpine	645	18,206	11,311	19			29,536
	Meadow-Field	60						
	All Upland	306,896	10,163,176	12,698,361	643,940	24,661	4,517	23,534,655
	Stream (Hand)	15,348	3,294,556	248,141	3,045,030		19,584	6,607,311
	Stream (Slash)	556	55,600		222,400			278,000
	Stream (Machine)	426	42,600		170,400			213,000
	All Stream	16,330	3,392,756	248,141	3,437,830		19,584	7,098,311
	All Types	323,226	13,555,932	12,946,502	4,081,770	24,661	24,101	30,632,966

TABLE NO. 10

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1923-1935
KANIKSU OPERATION

Working	Number of Acres Worked by Ownership Classes: Federal	State: Idaho	State: Washington	Private	Total Acres
First	163,034	67,643	1,780	80,766	313,223
Second	8,226	19		1,758	10,003
All Workings	171,260	67,662	1,780	82,524	323,226

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TABLE NO. 11

PROGRESS OF FIRST WORKING BY OWNERSHIP CLASSES, 1923-1935
KANIKSU OPERATION

Ownership Class		Number of Acres: Worked	Unworked	Total
Federal		163,034	209,338	372,372
State	Idaho	67,643	68,317	135,960
	Washington	1,780		1,780
Private		80,766	85,596	166,362
Total		313,223	363,251	676,474

BLISTER RUST CONTROL WORK IN WASHINGTON

1935

Work in Washington consisted of continuance of local control operations in Mount Rainier National Park, scouting for the disease in various parts of the state, and as usual the maintenance of the Western field office in Spokane. In addition to this work Ribes eradication was started on Mount Spokane during the field season of 1935. No special memorandum of understanding was executed with any state or private agencies to cover this work. Despite this fact, the customary co-operative relations were maintained with the Washington State Department of Agriculture and the State Forester's office.

RIBES ERADICATION, MOUNT RAINIER NATIONAL PARK, 1935

By
M. C. Riley
Associate Forester

Ribes eradication work on Mount Rainier National Park during the 1935 field season was performed by men from three ECW camps. A crew of ten men was secured from one ECW camp for work on the Longmire area, thirty men from another camp were used on the Stevens Canyon area and thirty men were secured from the third camp for work at White River. In Stevens Canyon a spike camp was necessary because of the distance between the main camp and the work.

A representative of the Division of Plant Disease Control assisted in starting the work. Technical foremen employed by the National Park Service were in direct charge of the various units.

The work on the Longmire area consisted of reworking a portion of stream type which had been given a first working in 1930 and 1931. The Stevens Canyon job was a continuation of stream type work started in 1932 and continued in 1933 and 1934. The work at White River consisted of extending the area covered during the years 1931 to 1934.

All Ribes eradication was performed by the hand pulling method. Crews varied in size depending upon the number of crew leaders available but in no case was it possible to use three-man crews.

The efficiency of the work was checked by the technical foremen using the inspection method.

Preeradication survey strips were run adjoining worked areas in an effort to appraise the amount of work remaining to be done. Ribes occurrence was plotted on maps made on a scale of four inches to the mile.

The following tables give the results of the Ribes eradication work:

TABLE NO. 1

SUMMARY OF RIBES ERADICATION, 1935
MOUNT RAINIER NATIONAL PARK

Area	Type	Acres	Man Days	Ribes Pulled							Total Ribes	Per Acre Basis	
				R. lac.	R. visc.	R. bract.	R. wat.	R. lax.	R. sang.	R. triste		Man Days	Ribes
Longmire	Stream	198	271			19,388					19,388	1.37	99
Stevens Canyon	Stream	494	1,238			93,111					93,111	2.51	188
White River	Upland	1,146	1,145	359	9,138		108,209	1,027	34	744	119,511	1.00	104
	Stream	489	269	41,091	953	56	119	263	18	8	42,508	.55	87
	Total	1,635	1,414	41,450	10,091	56	108,328	1,290	52	752	162,019	.86	99
All Areas	Total	2,327	2,923	41,450	10,091	112,555	108,328	1,290	52	752	274,518	1.26	118

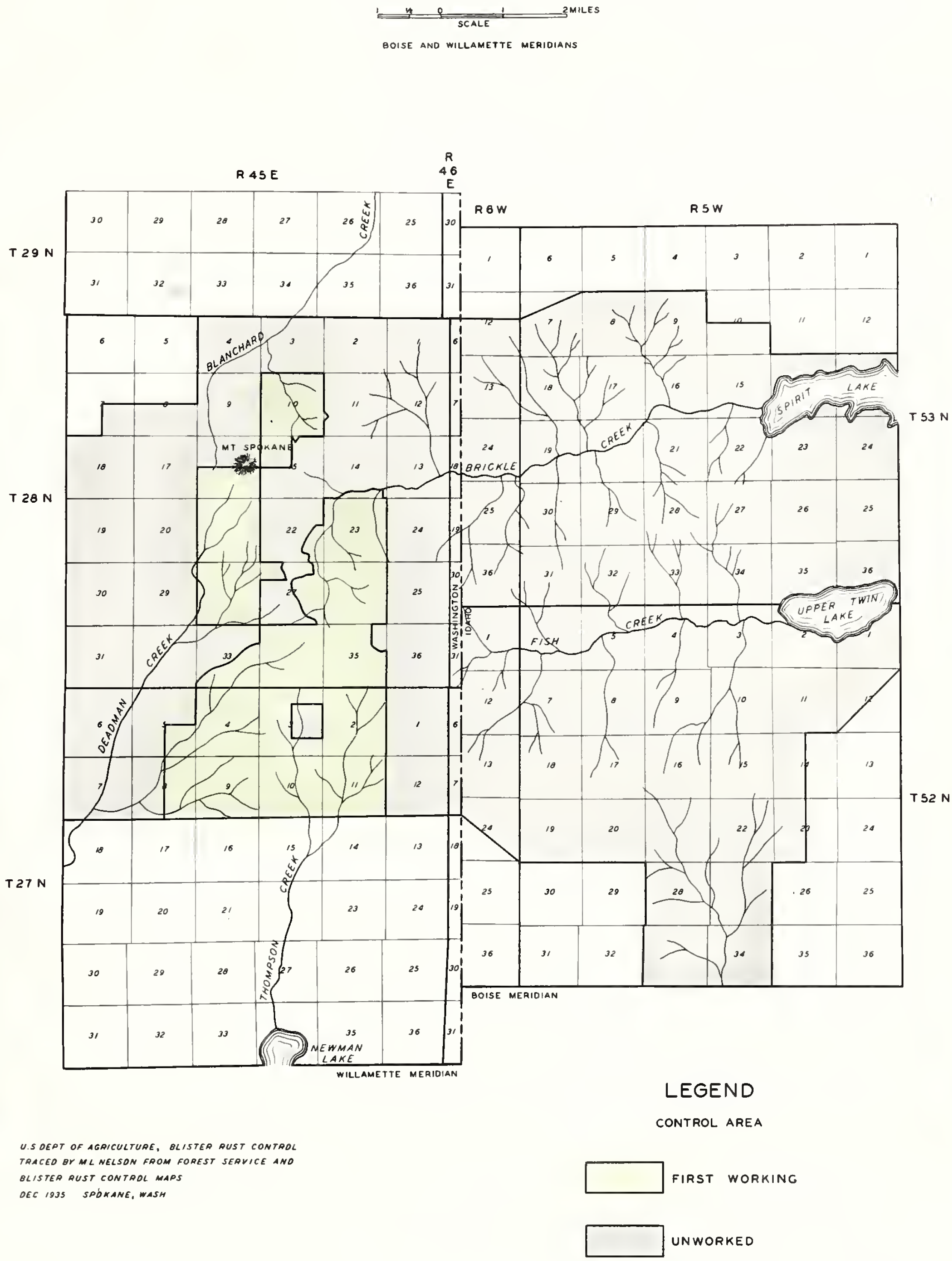
TABLE NO. 2

SUMMARY OF RIBES ERADICATION, 1930 TO 1935
MOUNT RAINIER NATIONAL PARK

Area	Acres: Initial Eradication	Acres: Re-erad.	Total Effective Man Days	Ribes By Species: R. lac.	R. visc.	R. bract.	R. wat.	R. lax.	R. acer.	R. sang.	R. triste	Total Ribes
Longmire	895	198	1,847	222,704		118,286		59,695	10,008	16		410,709
Stevens Canyon	830	112	3,383	27,328	5	268,224		914	11	19		296,501
White River	2,147	1,416	3,911	414,511	17,910	7,732	121,233	12,170	11,183	200	752	585,721
Starbo	426		329	14,007	6,713		7,206	3,767	19,372			51,065
All Areas	4,298	1,723	9,470	678,550	24,628	394,242	128,439	76,546	40,574	235	752	1,343,966

MT. SPOKANE OPERATION

BLISTER RUST CONTROL WORKING AREA



U.S DEPT OF AGRICULTURE, BLISTER RUST CONTROL
TRACED BY M.L NELSON FROM FOREST SERVICE AND
BLISTER RUST CONTROL MAPS
DEC 1935 SPOKANE, WASH

ANNUAL REPORT 1935
M.C RILEY

RIBES ERADICATION - MOUNT SPOKANE OPERATION, 1935

By
M. C. Riley
Associate Forester

INTRODUCTION

The Mount Spokane project includes the white pine blister rust control area on lands in the vicinity of Mount Spokane. The control area is situated approximately 30 miles northeast of the city of Spokane with about half of the area, 23,500 acres, in Spokane County in northeastern Washington and 26,000 acres in Kootenai County, Idaho.

Although Ribes eradication work has been done in previous years at Newman Lake, Washington, in connection with disease studies, the field season of 1935 marked the beginning of blister rust control work on the Mount Spokane project. During 1935, the work was confined to the area within the state of Washington.

Camps were started on July 28, and these were the first camps established by the Division of Plant Disease Control under the Emergency Relief program. Four 60-man camps and one 120-man camp were established. Work was continued in these camps until October 15.

Prior to the starting of camps, the operation supervisor and an assistant made an advance survey of a considerable portion of the area in order to establish control area boundaries and locate camp sites.

LOCATION AND DESCRIPTION OF AREA

The work centered around Mount Spokane on the headwaters of Blanchard and Brickel Creeks which flow east into Idaho, Thompson Creek which flows south into Newman Lake and Deadman Creek which is a tributary of the Spokane River.

Excellent white pine stands are present in small blocks over the entire area. Adjacent to these stands are areas which have supported white pine and which represent very good white pine sites. It is possible therefore to establish a control area in one solid block without having to work over any appreciable amount of sub-marginal area.

Small isolated clumps of white bark pine (Pinus albicaulis) occur on the upper slopes of Mount Spokane. Western white pine is more prevalent on the south and east slopes.

Slightly more than half of the area on which work was done was classed as open pole type and approximately 50% of the area was Ribes-free as determined by check strips.

Ribes viscosissimum and R. lacustre were the only species found on any area where Ribes eradication was performed this year. Approximately 55% of the bushes removed were R. lacustre. An area on Spirit Creek which it is planned to work at some future time contains about 250 acres of R. inerme and a small amount of R. petiolare.

RIBES ERADICATION - MOUNT SPOKANE OPERATION, 1935

By

W. C. Riley
Associate Forester

INTRODUCTION

The Mount Spokane project includes the white pine blister rust control area on lands in the vicinity of Mount Spokane. The control area is situated approximately 30 miles northeast of the city of Spokane with about [illegible] of the [illegible], 23,500 acres, in Spokane County in northeastern Washington and 26,[illegible] acres in Kootenai County, Idaho.

Although Ribes eradication work has been done in previous years at Newman Lake, Washington, in connection with disease studies, the field season of 1935 marked the beginning of blister rust control work on the Mount Spokane project. During 1935, the work was confined to the area within the State of Washington.

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All classes of working conditions were encountered. They were especially severe on Blanchard Creek where upland types averaged over 1000 Ribes per acre and there were much brush and many windfalls present. Most of the Ribes-free area was found on Thompson Creek and some of the tributaries of Deadman Creek. No major stream type was encountered but all streams had some Ribes along them. All upland types, including Ribes-free areas, averaged 253 Ribes per acre, and all stream type averaged 1,603 Ribes per acre.

A large portion of the land is in the hands of small private owners and through economic necessity the timber products are subject to extremely close utilization. Western white pine, white fir and hemlock are cut to very small diameter limits and the logs are trucked to market in Spokane. Within the last few years a large amount of fuel wood has been cut from the lands on the Mount Spokane area and this market utilizes practically all species except white pine to a diameter limit of only 3 or 4 inches. In some instances areas from which cordwood was removed only 2 or 3 years ago are now being cut over again.

The close utilization being practised on parts of the area and the practically uniform lack of brush disposal make the problem of Ribes eradication very difficult. Ground cover and crown canopy are being disturbed so frequently that in many cases there is a new crop of Ribes seedlings every year. In some places seedlings were appearing throughout the growing season. Lack of brush disposal not only increases the fire hazard but it also contributes to more difficult working conditions where Ribes are growing up through the slashings. Were slashings being burned, a more rapid and uniform germination could be expected and there would be more Ribes present to remove at a single working. More frequent and more continued reworking will probably be necessary as long as ground conditions are being changed so often. The failure to dispose of brush is a common practice among all small owners as well as of the one fairly large lumber company.

On Deadman Creek sheep were grazed for the first time during the 1935 field season and it is problematical what will occur in the way of accelerated seedling germination on this particular site.

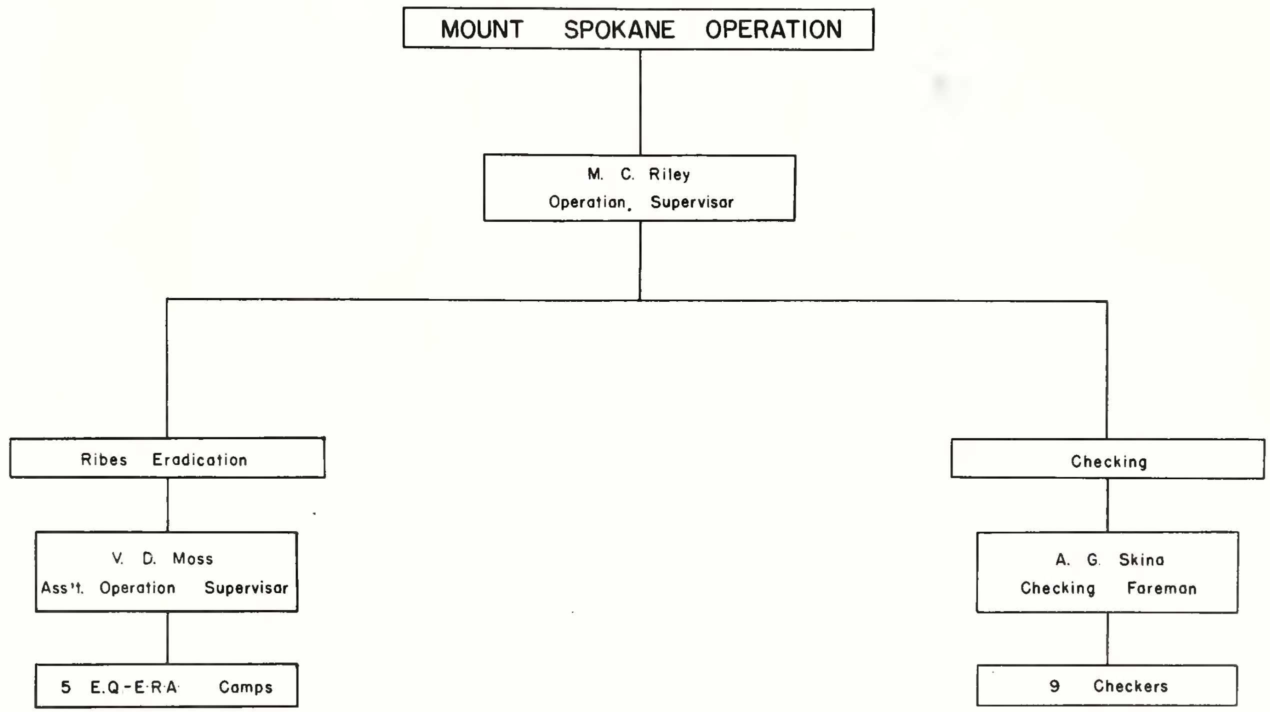
A definite pine infection center extending into Sections 20, 21, 28 and 29, T28N, R45E, and covering approximately 500 acres was found. This center occurs in an open pole stand where there is an understory of open reproduction. It is estimated that this center is of 1927 origin. There are a number of trees on the area which have already been killed by blister rust. One infected pine was also found on Fish Creek in Section 1, T52N, R6W.

Infection on R. viscosissimum was found generally distributed over the area worked during the 1935 season. On a late season survey, approximately 10 percent of the R. viscosissimum bushes were found to be infected.

ORGANIZATION AND ADMINISTRATION

The Mount Spokane operation was financed entirely by funds allotted to the Division of Plant Disease Control under the Emergency Relief Act. Since none of the lands involved are a part of any timber protective association or national forest, the only cooperators were owners of small parcels of land who donated the use of camp sites. Camp equipment used was owned by this Division and supplies

ORGANIZATION CHART



SIZE OF ORGANIZATION
Number of Camps — 5
4 66-man Camps
1 132-man Camp

Total Number of Men on Blister Rust Work — 402

were purchased through the Forest Service in Spokane from which point they were trucked direct to the camps. Fire fighting equipment for each camp was furnished by the State Forester's office. Operation headquarters was established at the most centrally located camp.

The accompanying organization chart illustrates the manner in which authority and responsibility were delegated.

METHODS AND EQUIPMENT

Since money was not available for starting camps before the last of July and because it was desired to employ men from relief rolls as soon as possible, no training camp for supervisory personnel was conducted. The camp bosses were able, however, to get on their areas a few days before the camps were actually started. The experience of starting Ribes eradication work without having the opportunity to train the supervisory personnel definitely indicated that there is a loss in efficiency and production until the supervisors become thoroughly familiar with the methods of conducting the work.

All eradication was performed by the hand pulling method. An effort was made to train sufficient crew leaders in order that 3-man crews could be used. In many cases this was not possible because there were not sufficient men who were reliable or who were willing to assume the responsibility. It was necessary therefore to use larger crews and in some cases in order to provide adequate supervision, as many as fifteen men were worked in a regular crew. Often these larger crews had two crew leaders assigned to them. When these larger crews encountered heavy Ribes concentrations or severe working conditions some of the more reliable laborers and the crew leaders would drop back out of line and work behind several men. Various crew methods were tried to meet the problem of immediate crew supervision and to keep the crews working at a steady pace. The larger crew proved to be the most satisfactory solution.

On areas of high Ribes population it was necessary to do a considerable amount of reworking in order to reduce the amount of Ribes on the area down to 25 feet of live stem per acre. Here again the lack of reliable men was a decided handicap. The method found to be the most efficient consisted of using regular crews, assigning one man to a strip, with the crew leader responsible for the several strips worked by his crew.

CHECKING

Checking work, under the direction of a checker foreman, was conducted primarily to give the eradication forces immediate and detailed information on the amount and distribution of Ribes on worked areas, to supply information regarding areas low in Ribes population and to secure data for permanent record maps to facilitate the planning of future work. A considerable amount of time was spent by the checking organization in making advance surveys of areas to supplement the rather meager information available.

A four percent sample check was made on worked areas by running parallel strips 13.2 feet in width at 5-chain intervals. Necessary data for compiling maps showing the amount and distribution of Ribes were recorded along each strip. The same method was used in Ribes-free areas except that the strip width used was 30

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All eradication was performed by the hand pulling method. An effort was made to train sufficient crew leaders in order that 8-man crews could be used. In many cases this was not possible because there were not sufficient men who were reliable or who were willing to assume the responsibilities. It was necessary therefore to use larger crews and in some cases in order to provide adequate supervision, as many as fifteen men were worked in a parallel crew. Often these larger crews had two crew leaders assigned to them. When these larger crews encountered heavy Ribes concentrations or severe working conditions some of the more reliable laborers and the crew leaders would drop back out of line and work behind several men. Various crew methods were tried to meet the problem of immediate crew supervision and to keep the crews working at a steady pace. The latter type proved to be the most satisfactory solution.

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A four percent sample check was made on worked areas by running parallel strips 16.5 feet in width at 5-chain intervals. Necessary data for compiling maps showing the amount and distribution of Ribes were recorded along each strip. The same method was used in Ribes-free areas except that the strip width used was

feet in order to give a safety measure before any area was definitely eliminated from crew work. Advance survey strips were run at 10-chain intervals using a strip width of 30 feet.

On the basis of time spent on activities directly connected with checking work, the average checking cost over the entire area was $.13 per acre.

PREERADICATION

No regular preeradication party was used on the Mount Spokane project. In addition to the advance survey strips mentioned above, the operation supervisor and his assistant devoted a considerable amount of time to examining territory within the control area in order to gain information about white pine stands and working conditions. The information secured will serve to supplement information gained from previous preeradication surveys which had been conducted on Fish Creek as well as data secured by the U. S. Forest Service in making an economic timber survey. Traverses were run along main drainages in order to definitely locate proposed camp sites so that individual land owners could be contacted regarding the use of their land.

It is estimated that there are approximately 28,700 acres of white pine area yet to be given a first working on the Mount Spokane operation.

STATEMENT OF COSTS AND EXPENDITURES

The statement of expenditures and costs includes those funds expended for Ribes eradication work performed on the Mount Spokane operation.

Effective man days in the following tabulations represent eight hours of work in the field by men actually engaged in the eradication of Ribes.

On account of the late season start of the ERA work and the maintenance of the camps in the field later than the normal operating season, the number of effective man days under this program for the 1935 season is considerably lower in relation to costs than it would be in the case of a full season of work. Consequently the cost per effective man day is higher than it would be under normal conditions.

TABLE NO. 1

EXPENDITURES BY APPROPRIATION, CALENDAR YEAR 1935
MOUNT SPOKANE OPERATION

Cooperating Agency	Appropriation	Amount
Bureau of Entomology and Plant Quarantine	NIRA	$ 5,102.18
	Regular	1,104.72
	ERA	66,219.40
Total Expenditures	All Appropriations	$72,426.30

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It is estimated that there are approximately 26,700 acres of white pine area yet to be given a first working on the Mount Spokane operation.

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Effective man days in the following tabulation represent eight hours of work in the field by men actually engaged in the eradication activities.

On account of the late season start of the work and the maintenance of the camps in the field later than the normal operating season, the number of effective man days under this program for the 1936 season is considerably lower in relation to costs than it would be in the case of a full season of work. Consequently the cost per effective man day is higher than it would be under normal conditions.

TABLE NO. 2

CLASSIFIED EXPENDITURES, CALENDAR YEAR 1935
MOUNT SPOKANE OPERATION

Item	Bureau of Entomology and Plant Quarantine NIRA	Regular	ERA	Total
Salaries, permanent men	$ 266.66	$ 266.66	$ 2,252.71	$ 2,786.03
Salaries, temporary appointed men	130.30		6,999.84	7,130.14
Wages, temporary laborers	221.44	814.78	39,369.82	40,406.04
Subsistence supplies	3,203.35		13,497.35	16,700.70
Equipment	23.25		123.84	147.09
Trucks			400.00	400.00
Travel and transportation	71.30	22.88	1,532.34	1,626.52
Twine	1,000.00			1,000.00
Other supplies and expenses	185.88	.40	2,043.50	2,229.78
Total Expenditures	5,102.18	1,104.72	66,219.40	72,426.30
Less 2/3 cost of new equipment	15.50		482.56	498.06
Less cost of unused supplies	900.00			900.00
Plus 1/3 cost of old equipment	1,201.45			1,201.45
Net cost 1935 operation	$5,388.13	$1,104.72	$65,736.84	$72,229.69

Effective 8-hour man-day cost was $6.69 based on the total net cost of the 1935 operation, $72,229.69.

The average cost per meal was $.213.

SUMMARY OF RIBES ERADICATION, 1935
MOUNT SPOKANE OPERATION

TABLE NO. 3

FIRST WORKING

Eradication Type	Acres First Working	Total Effective Man Days	Total Ribes	Per Acre Basis Man Days	Per Acre Basis Ribes	Ribes Remaining Per Acre Bushes	Ribes Remaining Per Acre Live Stem
Open Reproduction	1,356	3,137	916,411	2.31	676	5	15
Dense Reproduction	282	405	136,122	1.44	483	2	10
Open Pole	5,122	3,180	906,076	.62	177	3	9
Dense Pole	468	200	44,749	.43	96	3	15
Open Mature	306	1,024	258,570	3.35	845	4	10
Dense Meture	325	11	851	.03	3	2	14
Cut Over	131	171	98,137	1.31	749	3	17
Brush	1,362	1,419	225,216	1.04	165	3	7
Subalpine	284	169	44,596	.60	157	1	2
All Upland	9,636	9,716	2,630,728	1.01	273	3	10
Stream (Hand)	219	1,067	351,123	4.96	1,603	4	10
All Types	9,855	10,803	2,981,851	1.10	303	3	10

TABLE NO. 4

PROGRESS OF FIRST WORKING BY OWNERSHIP CLASSES, 1935
MOUNT SPOKANE OPERATION

Ownership Class		Number of Acres Worked	Number of Acres Unworked	Number of Acres Total
Federal		216	1,003	1,219
State	Washington	1,216	3,260	4,476
	Idaho		3,080	3,080
Private		6,423	32,302	40,725
Total		9,855	39,645	49,500

TABLE NO. 5

RESULTS OF CHECKING ON AREAS WORKED DURING 1935
MOUNT SPOKANE OPERATION

	Average Results for All Areas									Areas With More Than 25 Feet Live Stem Per Acre		
			Ribes Per Acre									
			Ribes lacustre		Ribes viscosissimum		All Species				Per Acre	
Eradication Type	Acres in Checked Area	Acres Checked	Bushes	Live Stem	Bushes	Live Stem	Bushes	Live Stem	Acres	Bushes	Live Stem
Open Reproduction	1,356	44.9	2.1	7.1	3.3	8.2	5.4	15.2	116	29.2	26.1
Dense Reproduction	282	16.9	1.6	9.8			1.6	9.6			
Open Pole	5,122	160.0	1.9	6.6	.9	2.2	2.8	8.8	22	22.2	73.3
Dense Pole	468	19.9	2.1	11.8	.5	2.8	2.6	14.6			
Open Mature	306	11.8	2.5	7.2	1.1	2.3	3.6	9.5			
Dense Mature	325	14.5	1.3	13.2	.3	.3	1.6	13.5			
Cut Over	131	4.8	1.9	15.8	.4	.6	2.3	16.5	13	11.1	53.7
Brush	1,362	50.2	.7	1.3	2.3	5.7	3.0	7.0			
Subalpine	284	10.3	.1	1.5			.1	1.5			
All Upland	9,636	333.3	1.7	6.6	1.3	3.3	3.0	9.9	151	26.6	35.4
Stream (Hand)	219	176.5	3.6	9.5			3.6	9.5			
All Types	9,855	509.8	2.0	7.1	1.1	2.7	3.1	9.6			

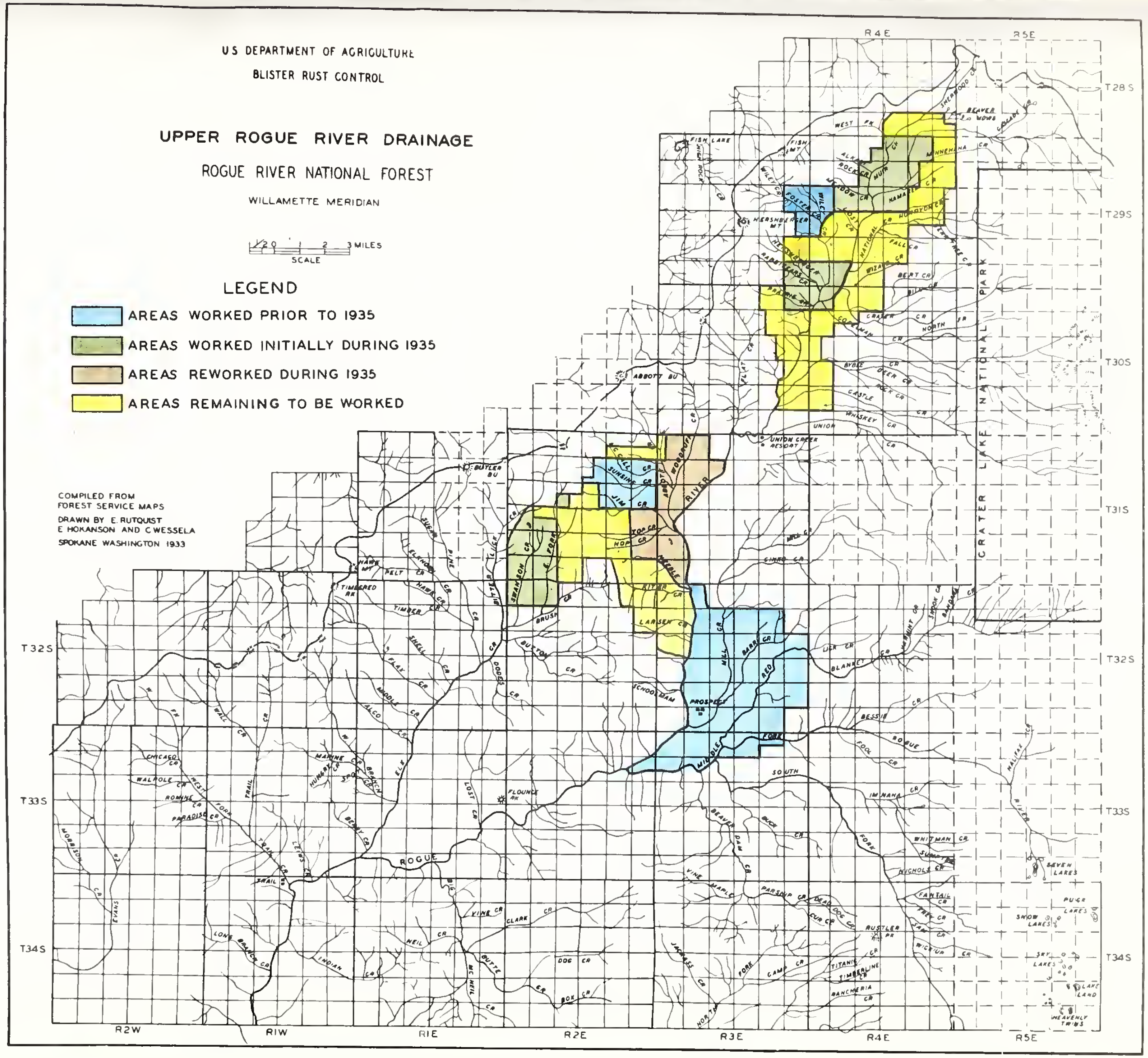
TABLE NO. 6

TOTAL RIBES BY SPECIES ERADICATED, 1935
MOUNT SPOKANE OPERATION

Working	Eradication Type	Acres	Ribes by Species: Ribes lacustre	Ribes by Species: Ribes viscosissimum	Total Ribes
First	Open Reproduction	1,356	397,706	518,705	916,411
	Dense Reproduction	282	120,606	15,316	136,122
	Open Pole	5,122	506,316	397,760	906,076
	Dense Pole	468	30,143	14,606	44,749
	Open Mature	306	117,511	141,059	256,570
	Dense Mature	325	511	340	851
	Cut Over	131	48,241	49,896	98,137
	Brush	1,362	55,660	169,556	225,216
	Subalpine	284	34,930	9,666	44,596
	All Upland	9,636	1,313,824	1,316,904	2,630,728
	Stream (Hand)	219	325,709	25,414	351,123
	All Types	9,855	1,639,533	1,342,318	2,981,851

BLISTER RUST CONTROL WORK IN OREGON
1935

Blister rust control activities in Oregon were continued as a cooperative project between the Bureau of Entomology and Plant Quarantine and the Bureau of Plant Industry of the State Department of Agriculture, the Oregon State Board of Forestry, and the Department of Plant Pathology of the Oregon State College.



ANNUAL REPORT 1935
C. P WESSELA

BLISTER RUST CONTROL ACTIVITIES IN OREGON, 1935

By
C. P. Wessela,
Associate Forester.

INTRODUCTION

Experimental Ribes eradication for the control of white pine blister rust was begun in Oregon on the Rogue River National Forest in 1925. Work was continued on this basis at varying intervals of time on this forest and on the Still Creek white pine plantation within the Mount Hood National Forest until 1933. During 1933 and 1934 an appropriation of Public Works Administration funds made it possible to establish control activities on a practical basis on the Rogue River National Forest and to completely rework the Still Creek white pine plantation. In addition to these activities initial work was begun in 1934 on the Mount Hebo eastern white pine plantation within the Siuslaw National Forest in order to prevent further damage to the planted pines. Therefore, at the beginning of the 1935 season in Oregon a total of 33,117 acres had been treated initially and 2,057 acres of this acreage had received the second treatment.

Funds with which to continue control operations in Oregon during 1935 were not available until August 1 at which time an appropriation of Works Progress Administration funds under the Emergency Relief Act of 1935 became available for expenditure. All control activities were confined to the Rogue River National Forest where six 75-man WPA camps were established between August 5 and August 15. Two camps were located in Douglas County, and four camps were located in Jackson County.

ORGANIZATION AND ADMINISTRATION

The Oregon operation was managed under the general supervision of the Oakland, California, Blister Rust office in much the same manner as the various California operations, a discussion of which appears in the California annual report. All expenditures against the WPA allotment for blister rust control work in Oregon were cleared through the Oakland office and audited and paid by the Federal Treasury office located in San Francisco.

One operation supervisor assisted by two unit supervisors was in direct charge of the operation. Each unit supervisor managed the work of three 75-man camps, the personnel of which was as follows:

1 Camp foreman (appointed)	Salary	$167.00	per	month
2 Assistant foremen (relief clients)	"	63.00	"	"
1 Supervisory cook (appointed)	"	125.00	"	"
2 Second cooks (relief clients)	"	63.00	"	"
1 Clerk (relief clients)	"	63.00	"	"
5 Flunkies and bull cooks (relief clients)	"	44.00	"	"
21 Crew leaders (relief clients)	"	50.00	"	"
42 Laborers (relief clients)	"	44.00	"	"

Camps were of more elaborate construction than those used in previous years, because of the larger size of the camps. Kitchens and mess halls were of

frame construction with floored kitchens, canvas roofing, and muslin siding to insure flyproof eating and cooking accommodations. Meat houses, sump holes, garbage pits, and latrines were also of flyproof construction and located in accordance with state health regulations. Facilities for bathing including sheltered quarters and hot and cold water were constructed in each camp.

Temporary operation headquarters were established in a rented building at Prospect, Oregon to serve as office headquarters for the operation and to furnish storage space for staple subsistence supplies and equipment. The headquarters staff consisted of a subsistence clerk, a typist and bookkeeper, a warehouseman, a truck driver, and a mechanic. This staff distributed supplies and equipment to the camps, kept trucks in good mechanical condition and handled correspondence and other records connected with the operation. The tremendous amount of detail work and records connected with the WPA set-up made a staff of this size imperative.

All of the personnel except those appointed by special regulations were employed and paid in accordance with regulations established by the WPA which stipulated that at least 90% of all personnel on the project paid from WPA funds must be selected from relief clients. Unskilled labor was paid $44.00, semi-skilled $50.00 and skilled $63.00 for 130 hours of work per month. All of the personnel were paid twice monthly. Approximately 70% of the personnel came from transient camps located in Jackson, Douglas and Coos counties as sufficient local relief clients were not available to man the project in either Jackson or Douglas counties.

As a whole men from transient camps were more satisfactory for Ribes eradication work than local reliefers from the two counties in which the work was carried on. The transients were younger, better clothed, in better physical condition, and were more accustomed to camp life and discipline. Most of the labor turnover occurred in the local relief client group and in particular those from within the larger towns. No labor trouble was encountered in any of the camps although reliable truck drivers, clerks, and assistant camp foremen were hard to find.

LOCATION AND DESCRIPTION OF AREAS

The 1935 work was divided into two units, the upper Rogue unit, and the Woodruff Meadows unit, each with an assignment of three camps. The upper Rogue unit lies north of Union Creek in townships 29 and 30 south, ranges 3 and 4 east. Total acreage within this control unit amounts to approximately 28,000 acres of white pine type. The entire area is heavily timbered with no cut-over areas and very few recent burns. An average of 200 Ribes bushes per acre occur on this area, however, 70% of the bushes occur within the stream type which comprises only 10% of the total area. About 20,000 acres remain to be treated on this unit.

The Woodruff Meadows unit comprises approximately 4,000 acres of white pine type and 21,000 acres of sugar pine type. This unit is northwest of Prospect between the North Fork of the Rogue River and the headwaters of Elk Creek in townships 31 and 32 south, ranges 2 and 3 east. As a whole the entire area is heavily timbered except for one burn of 640 acres. The topography is generally steep and rugged. Ribes occurrence is mainly confined to burns, rocky outcrops, small meadows, stream type, and high elevations particularly on the divide between

frame construction with floored sidewalls, canvas covering, and [illegible] to insure flyproof eating and cooking accommodations. [illegible] sites, and latrines were also of flyproof construction [illegible] with state health regulations. Facilities for bathing, laundry [illegible] and hot and cold water were constructed in each camp.

Temporary operation headquarters were established at [illegible] Prospect, Oregon to serve as office headquarters for the supervisor and as storage space for staple subsistence supplies and equipment. The headquarters staff consisted of a supervisor-clerk, a typist and timekeeper, a warehouseman, a truck driver, and a mechanic. This staff distributed supplies and equipment to camps, kept trucks in good mechanical condition, and [illegible] other records connected with the operations. [illegible] and records connected with the [illegible].

All of the personnel except [illegible] were employed and paid in accordance with [illegible] regulations [illegible] stipulated that at least 90% of all personnel on the project [illegible] must be selected from relief clients. [illegible] skilled [illegible] and skilled [illegible] personnel were paid semi-monthly. [illegible] transients [illegible] camps located in Jackson, Douglas [illegible] relief clients were not available to [illegible] counties.

As a rule, men from transient camps [illegible] eradication work, than local relievers from the two counties [illegible] carried on. The transients were younger, [illegible] condition, and were more accustomed to camp life [illegible] labor turnover occurred [illegible] from within the larger towns, [illegible] to find.

LOCATION [illegible] UNITS

The [illegible] control units, each with an assignment of [illegible] unit lies north of Union Creek, [illegible] Total acreage within this control unit amounts to [illegible] white pine type. The [illegible] very few [illegible]. An [illegible] area, however, [illegible] of the [illegible] 10% of the total area. [illegible]

The [illegible] control unit comprises approximately [illegible] pine type and [illegible] acres of sugar pine type. This unit [illegible] between the North Fork of the Rogue River and the headwaters of [illegible] townships 31 and 32 South, Ranges 3 and 4 East. [illegible] generally timbered except for one burn [illegible] steep and rugged. [illegible] small meadows, stream types, and high elevation [illegible]

Elk Creek and the North Fork of the Rogue River. A total of 6,[illegible] acres on this unit was covered for the second time during 1935. However, approximately 1[illegible],5[illegible] acres remain to be worked initially.

METHODS OF FIELD WORK

Standard methods of Ribes eradication were used and no special departure was made from the methods which have been described in previous annual reports. For all initial work the standard 3-man eradication crew was used. For rework, however, one and sometimes two select men of above average ability worked alone. Areas of heavy brush were reworked with the three-man crew because of the impaired visibility.

Late in the season a small area supporting Ribes cereum was treated by decapitating the bushes and applying Diesel oil to the lacerated crowns. A total of 663 bushes was treated in this manner using 325 gallons of diesel oil.

An analysis of results obtained during the 1935 field season shows rather definitely that reliefer labor of the type employed this year was considerably lower in general effectiveness than that used under the NIRA program of 1933-34. However, two other factors enter into the picture which undoubtedly caused a part of this lower efficiency. First, assistant camp foremen were selected from relief clients, and as a whole they proved unsatisfactory. They either lacked native supervising ability or were loath to exert their authority over men with whom they had lived and shared alike for the last few years. Consequently, there was a general lack of competent supervision. Secondly, the very short season and considerable cold rainy weather hardly allowed time enough for these inexperienced men to reach the peak of their productiveness in Ribes eradication.

COSTS

The following tables 1 and 2 give an analysis of the costs of the 1935 Ribes eradication operation in Oregon. The cost of the 1935 work was abnormally high for two reasons. First, work was not begun until approximately August 15 which allowed only a 2½-month field season. Costs of camp construction and dismantling were thus distributed over a short period. Secondly, a large percentage of the total number of man-days expended on the project were not expended on actual Ribes eradication.

Under WPA regulations men were paid for time lost on account of rain, holidays, etc. A total of 4,515 paid man-days was lost to Ribes eradication because of rain, holidays, and fire fighting; however, approximately 2,0[illegible] man-days which were lost to Ribes eradication because of rain were spent in constructing 2½ miles of road to an inaccessible portion of the upper Rogue control unit and in improving existing Forest Service roads and trails.

Elk Creek and the North Fork of the Rogue River. A total of [illegible] acres on this unit was covered for the second time during 1940. [illegible] approximately [illegible] acres remain to be worked initially.

Methods of Field Work

Standard methods of Ribes eradication were used and no special departure was made from the methods which have been described in previous annual reports. For all initial work the standard 5-man eradication crew was used. For reworking, however, one and sometimes two select men of above average ability worked alone. Areas of heavy brush were reworked with the three-man crew because of the [illegible] visibility.

Late in the season a small area supporting *Ribes* [illegible] was treated by decapitating the bushes and applying Diesel oil to the [illegible] crowns. A total of 563 bushes was treated in this manner using 310 gallons of Diesel oil.

An analysis of results obtained during the 1940 field season shows rather definitely that relief labor of the type employed this year was considerably lower in general effectiveness than that used under [illegible]. However, two other factors enter into the picture which undoubtedly caused a part of this lower efficiency. First, assistant camp foremen were selected from relief clients, and as a whole they proved unsatisfactory. These [illegible] ability or were loath to exert their authority over men with whom they lived and shared alike for the last few years. Consequently, [illegible] lack of competent supervision. Secondly, the camps spent much [illegible] cold rainy weather hardly allowed time enough for these [illegible] the peak of their productiveness in Ribes eradication.

Costs

The following tables 2 and 3 give an analysis of the costs of the 1940 Ribes eradication operation in Oregon. The cost of the work [illegible] high for two reasons. First, work was not begun until [illegible] allowed only a 3½-month field season. Costs of camp [illegible] were thus distributed over a short period. Secondly, a [illegible] total number of man-days expended on the project [illegible] Ribes eradication.

Under WPA regulations men were paid for time lost on account of [illegible] holidays, etc. A total of 4,516 paid man-days was lost [illegible] because of rain, holidays, and fire [illegible]. However, [illegible] days which were lost to Ribes eradication because of [illegible] 2½ miles of road to an inaccessible portion of the [illegible] improving existing Forest Service roads and trails.

TABLE NO. 1

CLASSIFIED EXPENDITURES BY APPROPRIATION AND NET COST OF OREGON OPERATION, 1935

Item		Appropriations			Total
		Nira	Regular	WPA	
Salaries, permanent men		$ 1,267.44	$216.66	$ 3,223.05	$ 4,707.15
Salaries, temporary men		713.80		47,155.32	47,869.12
Non-expendable equipment		9,056.00		7,297.45	16,353.45
Subsistence, supplies		227.66		15,531.09	15,758.75
Other services and supplies		2,887.80	2.76	1,826.70	4,717.26
Transportation and travel		1,271.08	71.20	1,860.17	3,202.45
Total expenditures		$15,423.78	$290.62	$76,893.78	$92,608.18
Plus	Pro rata share expense of Oakland office				4,115.31
	1/3 cost of non-expendable equipment purchased 1933-34				1,408.52
	Subsistence supplies on hand 1/1/35				180.00
Gross charges against 1935 operation					98,312.01
Less	2/3 cost non-expendable equipment purchased 1935				10,902.20
	Twine on hand 12/31/35				1,800.00
	Subsistence supplies on hand 12/31/35				489.96
Net cost of conducting 1935 operation					$85,119.85

TABLE NO. 2

STATEMENT OF MEAL COST

Item	Cost
Food	$15,041.13
Kitchen help	6,020.55
Transportation	1,040.24
Total	22,101.92
Amount paid by men for meals	9,246.41
Deficit	12,855.51
Total meals served	86,106
Average cost per meal	0.257
Average deficit per meal	0.149

RESULTS OF WORK

Tables 3 to 7 show results of Ribes eradication work during 1935. Tables 8, 9, and 10 show the checking results. A short discussion of the Oregon checking organization written by T. H. Harris, Associate Forester, acting as regional checking supervisor for California and Oregon, precedes the tables showing checking results.

TABLE NO. 3

SUMMARY OF RIBES ERADICATION ON THE ROGUE RIVER NATIONAL FOREST - OREGON WPA PROJECT

Acres Covered			Effective				
Worked by Crews	Blocked Out	Total	Man Days	Total Ribes Eradicated	Total Costs	Per Acre Ribes	Per Acre Costs
15,517	3,398	18,915	9,572	2,448,659	$ 85,119.85	129	$4.50

TABLE NO. 4

SUMMARY OF RIBES ERADICATION BY TYPES ON THE ROGUE RIVER NATIONAL FOREST, OREGON-WPA PROJECT

Class of Eradication	Eradication Type	Acres Covered	Effective Man Days	Ribes Eradicated	Costs	Per Acre Basis: Man Days	Per Acre Basis: Ribes	Per Acre Basis: Costs
INITIAL	Timber	11,158	3,533	600,477	$31,417.52	.32	54	$2.82
	Cut over	52	1		8.89	.02		.17
	Brush	224	1,400	471,429	12,449.62	6.25	2,105	55.58
	Stream	815	2,975	1,281,246	26,455.45	3.65	1,572	32.46
	Total	12,249	7,909	2,353,152	$70,331.48	.64	192	$5.74
SECOND WORKING	Timber	5,860	925	42,722	$ 8,225.64	.16	7	$1.40
	Brush	100	20	1,459	177.85	.20	15	1.78
	Stream	706	718	51,326	6,384.88	1.01	73	9.04
	Total	6,666	1,663	95,507	$14,788.37	.25	14	$2.21
TOTAL	Timber	17,018	4,458	643,199	$39,643.16	.26	38	$2.33
	Cut over	52	1		8.89	.02		.17
	Brush	324	1,420	472,888	12,627.47	4.38	1,460	38.97
	Stream	1,521	3,693	1,332,572	32,840.33	2.43	876	21.59
	Total	18,915	9,572	2,448,659	$85,119.85	.50	129	$4.50

TABLE NO. 5

SUMMARY OF RIBES ERADICATION BY OWNERSHIP ROGUE RIVER NATIONAL FOREST, OREGON WPA PROJECT

Ownership	Total Area Covered: Acres	Total Area Covered: Percent	Total Effective Man Days	Total Ribes Eradicated	Total Cost of Operation
Federal	17,323	91.6	9,396	2,441,247	$83,554.75
Private	1,592	8.4	176	7,412	1,565.10
Total	18,915	100.0	9,572	2,448,659	$85,119.85

TABLE NO. 6

SUMMARY OF RIBES ERADICATED BY SPECIES AND BY CLASS OF WORKING.
ROGUE RIVER NATIONAL FOREST, OREGON WPA PROJECT.

Ribes Species	Initial Working				2nd Working			
	Timber	Brush	Stream	Total	Timber	Brush	Stream	Total
R. lacustre	181,338		813,138	994,476	9,261	707	8,191	18,159
Percent of Total	30.20		63.46	42.26	21.68	48.46	15.96	19.01
R. binominatum	150,806	296,668	355,719	803,193				
Percent of Total	25.30	62.92	27.76	34.13				
R. cereum	80,792	327	7,791	88,910	64	274	400	738
Percent of Total	13.20	.07	.61	3.78	.015	18.78	.78	.77
R. viscosissimum	31,752	133,627	4,336	169,715	13	4	10	27
Percent of Total	5.20	28.35	.34	7.21	.003	.21	.19	.03
R. cruentum	55,150	292	3,864	59,306	12,140		782	12,922
Percent of Total	9.30	.06	.30	2.52	28.42		1.52	13.53
R. bracteosum	1,507		55,336	56,843				
Percent of Total	0.30		4.32	2.42				
R. erythrocarpum	9,684		11,340	21,024				
Percent of Total	1.6		.89	.90				
R. lobbii	50,277	[illegible],419	4,911	85,607	4,444	18	4,077	8,539
Percent of Total	8.40	6.45	.38	3.64	10.40	1.23	7.94	8.94
R. klamathense	8,331	4	13,671	22,[illegible]	5,858	193	34,027	40,078
Percent of Total	1.40		1.07	.9[illegible]	13.71	13.23	66.30	41.96
R. sanguineum	30,829	10,092	2,305	43,126	10,942	263	3,839	15,044
Percent of Total	5.10	2.14	.17	1.83	25.61	18.03	7.48	15.75
R. triste	11		8,935	8,946				
Percent of Total			.70	.38				
Total	600,477	471,429	1,281,246	2,353,152	42,722	1,459	51,326	95,507

TABLE NO. 7

TOTAL RIBES ERADICATED BY SPECIES
ROGUE RIVER NATIONAL FOREST, OREGON WPA PROJECT

Ribes Species	Timber	Brush	Stream	Total
R. lacustre	190,599	707	821,329	1,012,635
Percent of Total	29.63	.15	61.63	41.35
R. binominatum	150,806	296,668	355,719	803,193
Percent of Total	23.45	62.73	26.69	32.80
R. cereum	80,856	601	8,191	89,648
Percent of Total	12.57	.13	.61	3.66
R. viscosissimum	31,765	133,631	4,346	169,742
Percent of Total	4.94	28.26	.33	6.93
R. cruentum	67,290	292	4,646	72,228
Percent of Total	10.46	.06	.35	2.94
R. bracteosum	1,507		55,336	56,843
Percent of Total	.23		4.15	2.32
R. erythrocarpum	9,684		11,340	21,024
Percent of Total	1.51		.85	.86
R. lobbii	54,721	30,437	8,988	94,146
Percent of Total	8.50	6.44	.67	3.84
R. klamathense	14,189	197	47,698	62,084
Percent of Total	2.20	.04	3.58	2.53
R. sanguineum	41,771	10,355	6,044	58,170
Percent of Total	6.49	2.19	.45	2.38
R. triste	11		8,935	8,946
Percent of Total	.02		.67	.37
Total	643,199	472,838	1,332,572	2,448,659

CHECKING

Checking activities on the Rogue River operation were handled by checking supervisor Lyle N. Anderson who was directed by the regional checking supervisor for California and Oregon. As a description of the checking organization may be found in the report of Ribes eradication in California, a repetition in this report is unnecessary.

The six appointed men assisting Anderson were hired after eradication work had begun, and their assistance was required in that work for a period early in the season. The press of work thus made it impracticable to hold a training school, but the men were individually trained for their jobs by the supervisor. Checking work followed eradication closely until the last two weeks of the season when, in spite of working seven days a week, it fell behind, so that 2,817 acres remain to be checked in 1936.

[illegible]

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

[illegible]

[illegible]

TABLE NO. 8

SUMMARY OF REGULAR CHECKING RESULTS - SEASON OF 1935
ROGUE RIVER NATIONAL FOREST, OREGON

Eradication Type	Acres Covered by Eradication	Acres Covered by Check	Percent of Check	Man Days	Areas Averaging Less Than 25 F.L.S.* Per Acre			Areas Averaging More Than 25 F.L.S.* Per Acre			Acres Unchecked
						Ribes Per Acre			Ribes Per Acre		
					Acres	Bushes	F.L.S.	Acres	Bushes	F.L.S.	
Timber	16,946	14,416	4.1	220	13,300	.5	1.8	1,116	6.6	67.0	2,530
Cut over	52	52	4.0	1-2/8	52	.0	.0				
Brush	3[illegible]4	255	6.6	9-3/8	152	2.0	7.3	103	20.8	73.3	69
Stream	1,438	1,220	12.4	83-4/8	1,151	1.4	4.2	69	21.3	187.8	218
All Types	18,760	15,943	4.8	313-1/8	14,655	.7	2.4	1,288	9.5	83.3	2,817**

*F.L.S. = feet of Ribes live stem.

**Includes 630 acres checked, subsequently reworked, but not rechecked.

TABLE NO. 9

SUMMARY OF ADVANCE CHECKING RESULTS - 1935
ROGUE RIVER NATIONAL FOREST, OREGON

Eradication Type	Acres Covered by Advance Check	Man Days	Area Eliminated from Crew Work			
			Acres	Percent of Check	Bushes Per Acre	
					Bushes	F.L.S.
Timber	826	8	72	10.8	1.0	2.5
Stream	83	1-3/8	83	5.4	0.0	0.0
Total	909	9-3/8	155	7.9	0.5	1.3

TABLE NO. 10

COSTS AND CLASSIFICATION OF CHECKING TIME - SEASON OF 1935
ROGUE RIVER NATIONAL FOREST, OREGON

Item	Regular Checking	Advance Checking	All Checking	Eradication	Totals
Man Days	387-2/8	14-2/8	401-4/8	148-5/8	550-1/8
Cost	$1,903.78	$70.31	$1,974.09	$730.14	$2,704.23
Percent of total Man Days	70.4	2.6	73.0	27.0	100.0
Acres per man day	44.2	63.8	44.9		
Cost per acre	$ 0.131	$ 0.099*	$ 0.110		

* 37.3¢ per acre eliminated from crew work

BLISTER RUST CONTROL WORK IN CALIFORNIA
1935

Blister rust control activities in California were continued as a cooperative project between the Bureau of Entomology and Plant Quarantine and the California Department of Agriculture, the California State Board of Forestry, and the College of Agriculture, University of California.

RIBES ERADICATION IN CALIFORNIA, 1935

By

W. V. Benedict, Forester

INTRODUCTION

At the close of field work in 1934, the total area on which Ribes eradication work had been performed in California was 260,806 acres, or 13 percent of the total commercially important sugar pine type. Of this acreage second eradication had been completed on 17,991 acres and third eradication on 4,180 acres. Because of the recent inauguration of large scale work in California, however, all reeradication on areas worked prior to 1934 was entirely up to date at the start of 1935, except for two small areas, one on the Plumas National Forest and one on the Stanislaus. Aside from these two areas which were reworked, the 1935 operation consisted of a further expansion of initial eradication on control areas of the Plumas, Eldorado, and Stanislaus National Forests. In addition to these three going operations, control work was started for the first time on the Sierra National Forest.

On July 11, 1935 funds amounting to $874,685 were approved by the Works Progress Administration for blister rust control work in the commercially-important sugar pine stands of California. However, due to delays in setting up the machinery of the Treasury offices for handling procurements and disbursements, it was not until the first of August that actual field operations could be put in motion, although detailed plans of work and field personnel were fully assembled early in the summer. Because of insufficient funds, no eradication work was performed during 1935 prior to the approval of the WPA allotments.

FOREST SERVICE COOPERATION

The Forest Service in Region 5 made no allocation of WPA funds to Blister Rust Control during 1935. However, they had an unobligated balance in their Imonira and Lieunira Blister Rust funds of 1934 and a small salary and expense blister rust allotment for 1935, and this money was used by them to purchase additional blister rust equipment and to pay the salaries and expenses of two blister rust technicians who were assigned to blister rust work under the supervision of the Oakland office. The equipment purchased in 1935 along with the Forest Service share of the equipment purchased from the joint fund in 1934 was turned over to this office for use on blister rust control. This equipment, although remaining the property of the Forest Service, is retained in the custody of the Oakland office, along with the regular property of the Blister Rust Office. The Forest Service expenditures are shown in table No. 5. A number of trucks and other miscellaneous items of equipment were also loaned to the blister rust project during the field season by the Forest Supervisors.

In addition to the above cooperation, the personnel of the Forest Service, both in the Regional Office and at the several national forest headquarters, gave willingly of their time and office facilities in assisting blister rust field supervisors in the organization of their work. In so far as the limitations in funds would permit, the same cooperative relationship established under the jointly financed program of 1934 was continued this year.

[illegible] IN CALIFORNIA, 1935

by

[illegible] Benedict, Forester

INTRODUCTION

At the close of field work in 1934, [illegible] cation work had been performed in California was [illegible] acres, [illegible] the total commercially important sugar pine type. [illegible] cation had been completed on [illegible] acres [illegible]. Because of the recent inauguration of large scale work on [illegible], all reeradication on areas worked prior to [illegible] start of 1935, except for two small areas, one on the [illegible] one on the Stanislaus. [illegible] operation consisted of a further [illegible] areas of the Plumas, [illegible] and Stanislaus National Forests. [illegible] these large going operations, control work was started [illegible] Sierra National Forest.

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FOREST SERVICE COOPERATION

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ORGANIZATION AND ADMINISTRATION

A. Organization of the Oakland Regional Office

One of the provisions of the Emergency Relief Act of 1935 was to establish in each state branch offices of the Treasury Department to handle procurements, accounts, and disbursements made from WPA funds. In accordance with this provision, the Oakland Blister Rust Office was made the regional headquarters for blister rust activities in Oregon and California under the general supervision of the Western Division headquarters located at Spokane. All expenditures against the WPA allotments of these two states were therefore cleared through Oakland and audited and paid by the state treasury offices located in San Francisco.

With the opening of the WPA program, it therefore became immediately necessary to organize an office force at Oakland capable of handling the enormous volume of business detail required under this program, for the regular office staff of one administrative assistant and one stenographer-typist was woefully inadequate.

Clerks experienced in general government business practice were simply not available and it was necessary to temporarily transfer technical men from field duties in order to place the office on an operating basis at the earliest possible moment. This was no small task. The treasury offices were just being organized and there was a general paucity of authentic instructions on methods of doing business. The employment of security wage typists, stenographers, and clerks did not immediately alleviate the pressure because of their total unfamiliarity with government procedure. However, the field program was put in motion unhampered from this source and in a few weeks' time a somewhat heterogenous group of workers was molded into an effective business organization.

B. Organization of Field Project

The 1935 WPA project consisted of 22 camps distributed on the Plumas, Eldorado, Stanislaus, and Sierra National Forests, and a detail of people assigned to the Oakland office as follows:

EMPLOYMENT UNDER WPA FUNDS AS OF DECEMBER [illegible], 19[illegible]

Operation	Total Number Persons Employed				Maximum Employed at One Time				
	Reliefers	Non-reliefers	Appt'd.	Total	Reliefers	Non-reliefers	Appt'd	Total	No. Camps
Plumas	650	8	25	683	480	4	25	509	6
Eldorado	514	3	22	539	388	3	19	410	5
Stanislaus	582	8	20	610	398	7	18	423	5
Sierra	609	2	15	626	505	1	14	520	6
Oakland Office and Warehouse	27	1	1	29	23	1	1	25	-
Total	2,382	22	83	2,487	1,794	16	77	1,887	22

All camps were designated as 75-man camps but each carried sufficient surplus equipment to accommodate up to 85 men. An attempt was made to maintain maximum strength at all times but due to turnover at camps and shortage of laborers this was only temporarily possible.

The personnel of a 75-man camp was as follows:

1 camp foreman (appointed)	@ $167.00	per month
3 straw bosses (reliefers)	@ 63.00	per month
1 supervisory cook (appointed)	@ 125.00	" "
1 second cook (reliefer)	@ 63.00	" "
1 clerk (reliefer)	@ 63.00	" "
6 flunkies and bull cooks (reliefers)	@ 44.00	" "
21 crew leaders (reliefers)	@ 50.00	" "
41 laborers (reliefers)	@ 44.00	" "
1 checker (appointed)	@ 125.00	" "

The general technical supervision of each operation consisted of the following appointed personnel of the Division:

General

W. V. Benedict, Forester, Project Leader, Sugar Pine Region.
T. H. Harris, Associate Forester, Operations Checking Supervisor.

Plumas Operation

Operation Supervisor - Benton Howard, Junior Forester
Assistant Operation Supervisor - Ralph A. James, Agent
Unit Supervisor - S. Deryl Adams, Agent
Checking Supervisor - John N. Mitchell, Junior Forester (Mitchell was employed by the Forest Service from June 3, 1935 to November 16, 1935, at which time he was transferred to this Division)

Eldorado Operation

Operation Supervisor - D. P. Miller, Associate Forester
Assistant Operation Supervisor - Eugene H. Kincaid, Agent (acting)

Unit Supervisor - Robert Sovulewski, Agent
Checking Supervisor - John C. Crowell, Agent

Stanislaus Operation

Operation Supervisor - Roy Blomstrom, Associate Forester
Assistant Operation Supervisor - Arthur London, Agent
Unit Supervisor - Carl W. Fowler, Agent
Checking Supervisor - Elmer E. Smith, Junior Forester (Elmer Smith was employed by the Forest Service until his death on August 13, 1935)

Sierra Operation

Operation Supervisor - Frank A. Patty, Associate Pathologist
Assistant Operation Supervisor - Robert [illegible]. Riley, Agent
Unit Supervisor - W. B. Dunshee, Agent (furloughed October 31, 1935)
Checking Foreman - Niels D. Lindeberg, Agent (furloughed November 1[illegible], 1935)

All men paid at the security-wage rate who boarded at camp were assessed a meal charge of 1/5th of 1/30th of their monthly salary for each day in camp. Men under appointment were charged the full cost of meals, which was figured at the rate of $22.50 per month.

In addition to the above trained blister rust technicians, each operation employed from one to three truck drivers to haul supplies, equipment and men; from one to three clerks and typists, one warehouseman, one mechanic, and while camps were under construction one to three carpenters and a plumber. Most of this facilitating personnel consisted of relief labor.

Camps were established just as soon after August 1 as men could be obtained from relief rolls and continued in operation until snow and freezing weather terminated field work in early November.

Camps were constructed in accordance with the following standardized specifications:

1. Kitchen and mess of frame construction with kitchen section floored, canvas roofing, and either screen or muslin siding to insure fly-proof cooking and eating accommodations, hot and cold water piped into kitchen.

2. Screened and fly-proof meat house.

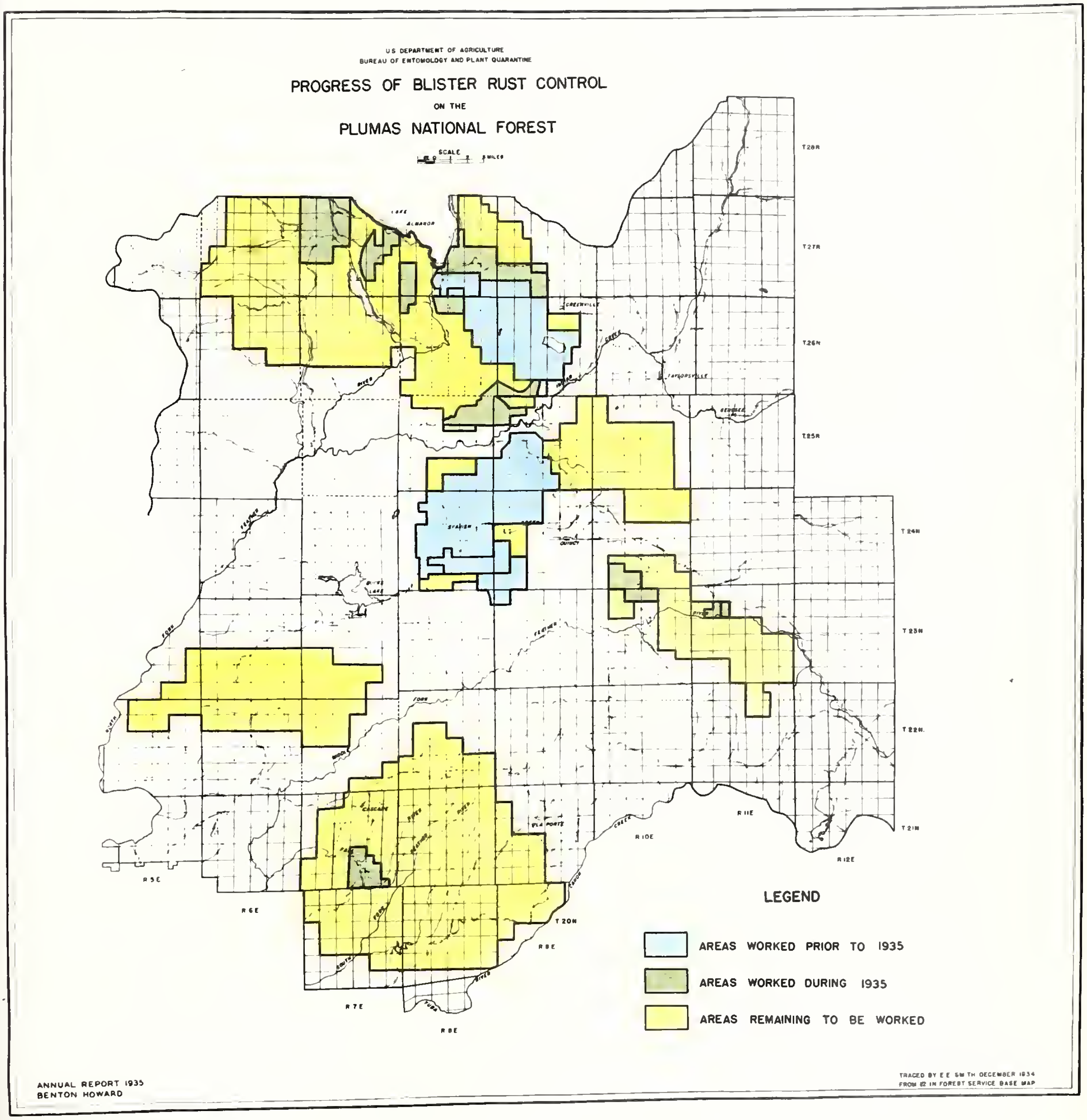
3. Boxed-in fly-proof sump hole connected to kitchen by drain pipe.

4. Boxed-in garbage pit.

5. Boxed and fly-proof latrines.

6. Facilities for bathing including sheltered quarters and hot and cold water.

All labor was employed and paid in accordance with regulations established by the Works Progress Administrator which specified that at least [illegible]



U S DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
PROGRESS OF BLISTER RUST CONTROL
ON THE
PLUMAS NATIONAL FOREST
SCALE
MILES
LAKE ALMANOR
GREENVILLE
TAYLORSVILLE
T 28 N
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R 10 E
R 11 E
R 12 E
LEGEND
AREAS WORKED PRIOR TO 1935
AREAS WORKED DURING 1935
AREAS REMAINING TO BE WORKED
ANNUAL REPORT 1935
BENTON HOWARD
TRACED BY E E SMITH DECEMBER 1934
FROM ½ IN FOREST SERVICE BASE MAP

percent of all people paid from WPA funds must be taken from relief rolls. Likewise all people not under appointment were paid at approved security wage rates. For the California operations a uniform rate of $44 for unskilled labor, $50 for intermediate or semi-skilled, and $63 for skilled was approved. Security wage workers were required to work 130 hours a month, the work at camp being standardized at 6½ hours a day from Monday to Friday, inclusive. Appointed personnel worked the regular 44-hour week. Men were paid twice monthly.

Three general classes of relief labor were used on blister rust work:

1. Eligible reliefers from the foothill counties adjoining areas where the project was located.

2. Reliefers obtained from cities, chiefly Fresno, Stockton, Sacramento and East Bay cities.

3. Eligible transients located in the state and federal transient shelters throughout the state.

Labor obtained from the local foothill counties, while decidedly in the minority, was by far the best of the three types of labor employed, probably because they were familiar with woods work. The city labor was the least adapted to blister rust control, and it was in this class that the greatest turnover occurred. Men from transient camps were somewhat of a diversified lot but in general their work was of average quality and much superior to the work of city labor.

No evidence of labor trouble was reported from any of the camps although a number of individuals were discharged because of their unwillingness to work. The greatest single factor with which the camp foremen had to contend was liquor and many men had to be released because they could not control their desires for strong drink.

Because of the difficulty in obtaining and retaining relief labor, much time was spent by blister rust supervisors in contacting employment officials for additional quotas of men and in directing the movement of men to and from camps. G. A. Root, Associate Pathologist, stationed at Sacramento, acted as liaison officer between the employment offices and blister rust field operations.

LOCATION AND DESCRIPTION OF AREAS

Plumas Operation

Four of the six camps making up this operation were located in the large block of sugar pine timber lying south of Lake Almanor and west of the town of Greenville. The work in this unit was a continuation of work started in 1934. Both virgin and cut-over timber type conditions were encountered and Ribes varied from light to medium in the timber stands and generally heavy in the logged areas. A number of the streams tributary to the North Fork of the Feather River supported dense thickets of willow-*Ribes inerme* type. Principal ownerships are Federal, Red River Lumber Company, and Wolf Creek Timber Company.

The fifth camp was located in the Thompson Creek unit which lies about five miles southeast of Quincy between the American Valley and the Middle Fork of

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PROGRESS OF BLISTER RUST CONTROL

ON THE

ELDORADO NATIONAL FOREST

SCALE

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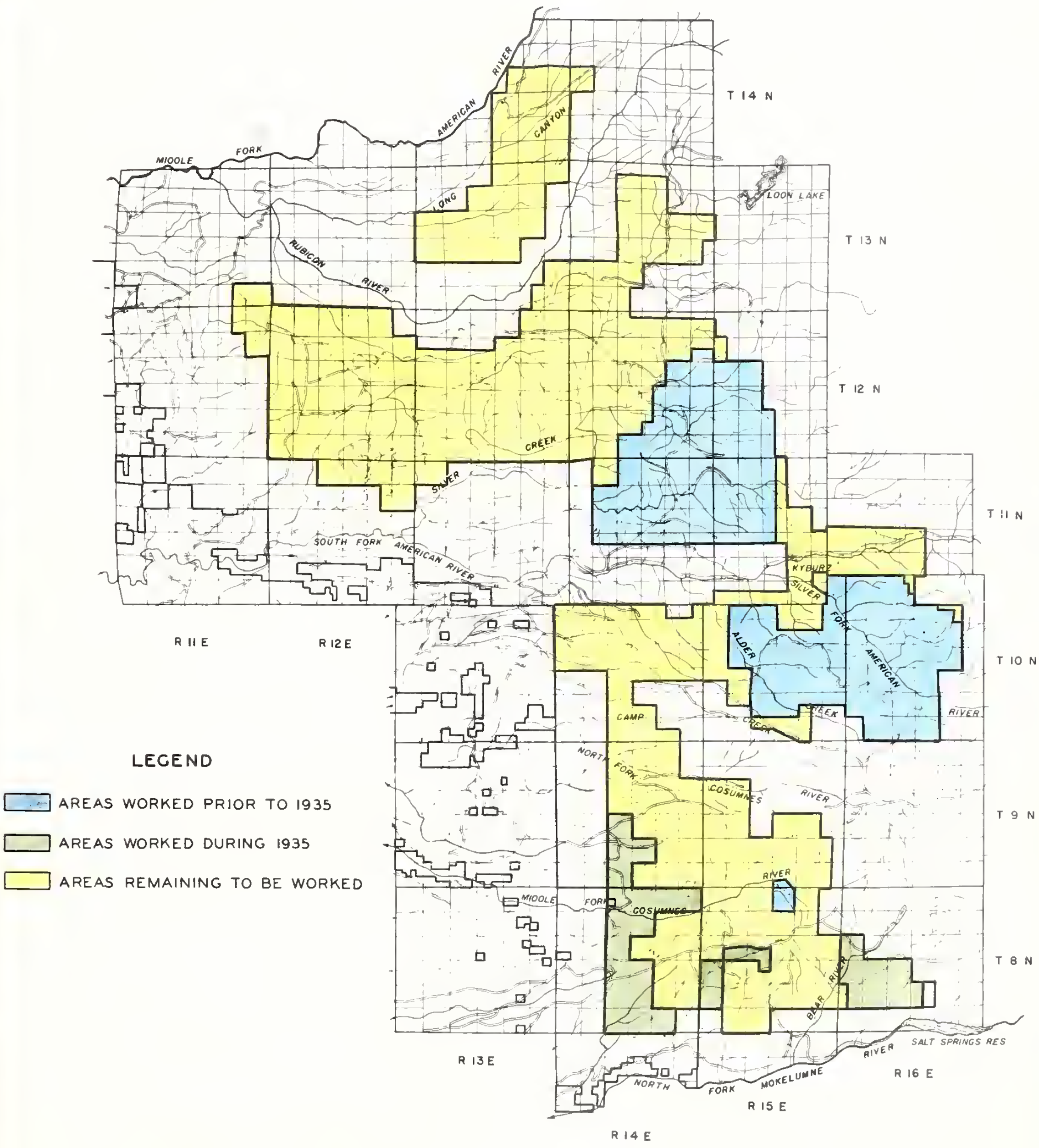

ANNUAL REPORT 1935

D. R. MILLER

TRACED BY BENTON HOWARD FROM ½" FOREST SERVICE BASE MAP JAN 1936

the Feather River. This area is largely federally owned and for the most part is unlogged. Ribes roezli bushes are rather uniformly abundant over the unit.

The five camps mentioned were located in Plumas County. [illegible] in Butte County near Cascade in the large block of sugar pine centering around the South Fork of the Feather River. This area is largely owned by the Feather River Pine Mills, Inc. (formerly the Hutchinson Lumber Company). Ribes are abundant and the topography is rugged although the sugar pine timber is of generally good quality and forms a high percentage of the stand.

Eldorado Operation

The five camps on the Eldorado Forest were all located in the block of sugar pine timber along the drainage of the Middle Fork of the Consumnes River and the North Fork of Mokelumne River on the extreme southern boundary of the forest. Three camps were located in Eldorado County and two in Amador County. Principal ownerships treated were Federal, California Door Company, and Ruggles Estate. All of the area worked along the western boundary of the unit was cut over. Ribes were rather uniformly abundant over the entire unit, particularly so on the logged areas. Sugar pine, although of good quality, was not as numerically important as on the control units of the other operations.

Stanislaus Operation

Control work on the Stanislaus Forest was distributed over three units. Two camps were located in Calaveras County adjoining the area worked during 1934 along the drainage of the South and Middle Forks of the Mokelumne River. This unit, largely in the ownership of the Ruggles Estate, consists of a large block of excellent virgin sugar pine timber. Ribes are generally few and scattered.

Three camps were located in Tuolumne County, one in the Strawberry unit to complete a small parcel of untreated land near Cold Spring and on the North Fork of the Tuolumne River, and two in the Thompson Meadows unit on the west side drainage of the Clavey River. These units were entirely cut over and Ribes were consistently dense throughout. The West Side Lumber Company and the Federal Government were the two principal landowners. Sugar pine reproduction, chiefly pole sizes, is some of the finest on the forest.

Sierra Operation

Four of the six camps on the Sierra Forest were located in Mariposa County and two in Madera County. All were located in cut-over federally owned sugar pine type known as the Chowchilla country in the northern part of the forest. Sugar pine reproduction, although somewhat patchy, is of good quality, being particularly well distributed on the Government cutting areas of the upper Chowchilla. Aside from small spots, this entire region supports an enormous number of thrifty Ribes bushes, chiefly R. roezli, generally intermixed with white-thorn brush (ceanothus cordulatus).

METHODS OF WORK

Except for minor changes as here outlined, methods of performing eradication work were similar to those used in past years.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

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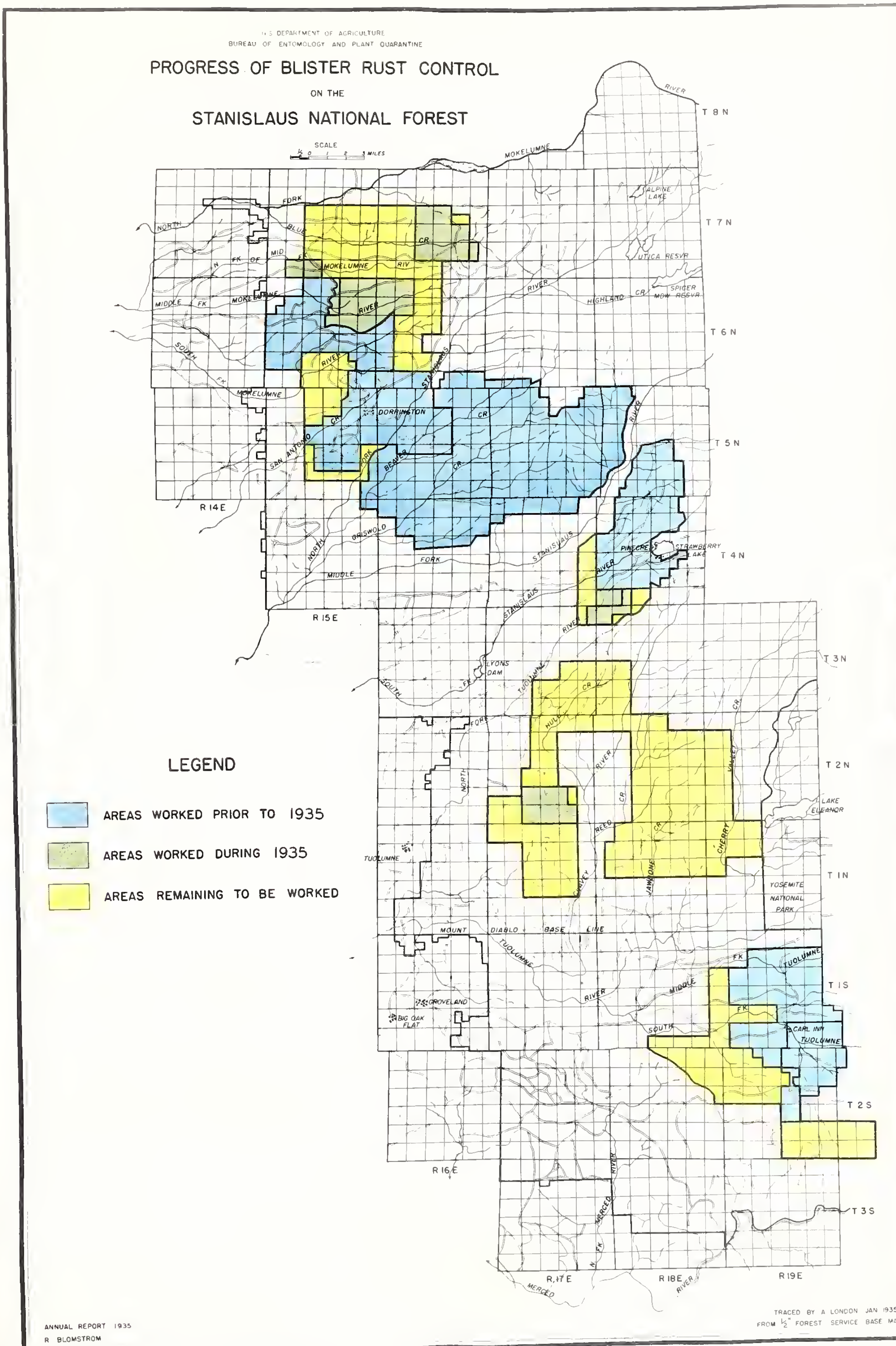
U.S. DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
PROGRESS OF BLISTER RUST CONTROL
ON THE
STANISLAUS NATIONAL FOREST
SCALE
½ 0 1 2 3 MILES
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AREAS WORKED PRIOR TO 1935
AREAS WORKED DURING 1935
AREAS REMAINING TO BE WORKED
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R 14 E
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R 17 E
R 18 E
R 19 E
MOKELUMNE
RIVER
ALPINE LAKE
UTICA RESVR
SPICER MDW RESVR
HIGHLAND CR
DORRINGTON
BEAVER CR
SAN ANTONIO CR
PINECREST
STRAWBERRY LAKE
GRISWOLD
LYONS DAM
HULL CR
REED CR
CHERRY
JAWBONE CR
LAKE ELEANOR
YOSEMITE NATIONAL PARK
TUOLUMNE
MOUNT DIABLO BASE LINE
GROVELAND
BIG OAK FLAT
CARL INN
MERCED
ANNUAL REPORT 1935
R BLOMSTROM
TRACED BY A LONDON JAN 1935
FROM ½" FOREST SERVICE BASE MAP

Due to the lateness of the season and the need for rapid establishment of camps, no regular training school for camp foremen and straw bosses was held. Instead the necessary training work was done along with regular work. This procedure was purely an emergency measure and under normal circumstances is not recommended to take the place of a regularly scheduled intensive weekly training school held immediately preceding eradication work.

Much of the eradication work this year was performed late in the season and past the period of most effective work from the standpoint of Ribes leaf conditions. It was accordingly necessary to modify regular eradication methods to the extent of reducing the interval between crewmen more than would normally be the case in the particular area being treated. This reduction in strip width lowered production but such action was necessary in order to maintain the requisite standards of control. Wherever possible string lines were established in advance of crews in order to secure uniformity in width of strips and to relieve the crews of this job.

The heavy turnover of WPA laborers made it continually necessary to condition and train new men and this situation plus the lowered working conditions arising from the lateness of the season resulted in an abnormal amount of rework.

From the standpoint of general efficiency and effectiveness as laborers on blister rust control, the WPA workers of 1935 would be classified about midway between the CCC workers of 1933 and the NIRA workers of 1934.

Because of a general shortage in properly qualified straw boss material from among security wage workers, the camp foreman found it necessary to concentrate the work of his crews in the smallest possible area in order to enable him to give adequate supervision to field work. Through a similar dearth of competent clerical assistants, the operation supervisors and their assistants found it necessary to devote an abnormally high percentage of their time to general administrative jobs that under ordinary conditions could be assigned to a trained field clerk.

During the latter part of October when defoliation had become practically complete, particularly on southern exposures, it was necessary to largely restrict eradication work to localities where Ribes were particularly abundant.

Rework was accomplished in most cases by standard 3-man crews rather than with select crews of one and two men simply because of the fact that a sufficient number of qualified men were not available for individual rework assignments

RESULTS OF WORK

The results of Ribes eradication in California during the 1935 season are set forth in the following tables. The work accomplished on each national forest is shown separately: a general summary in table No. 1, according to eradication type in table No. 2, according to class of ownership in table No. 3, and by Ribes species in table No. 4.

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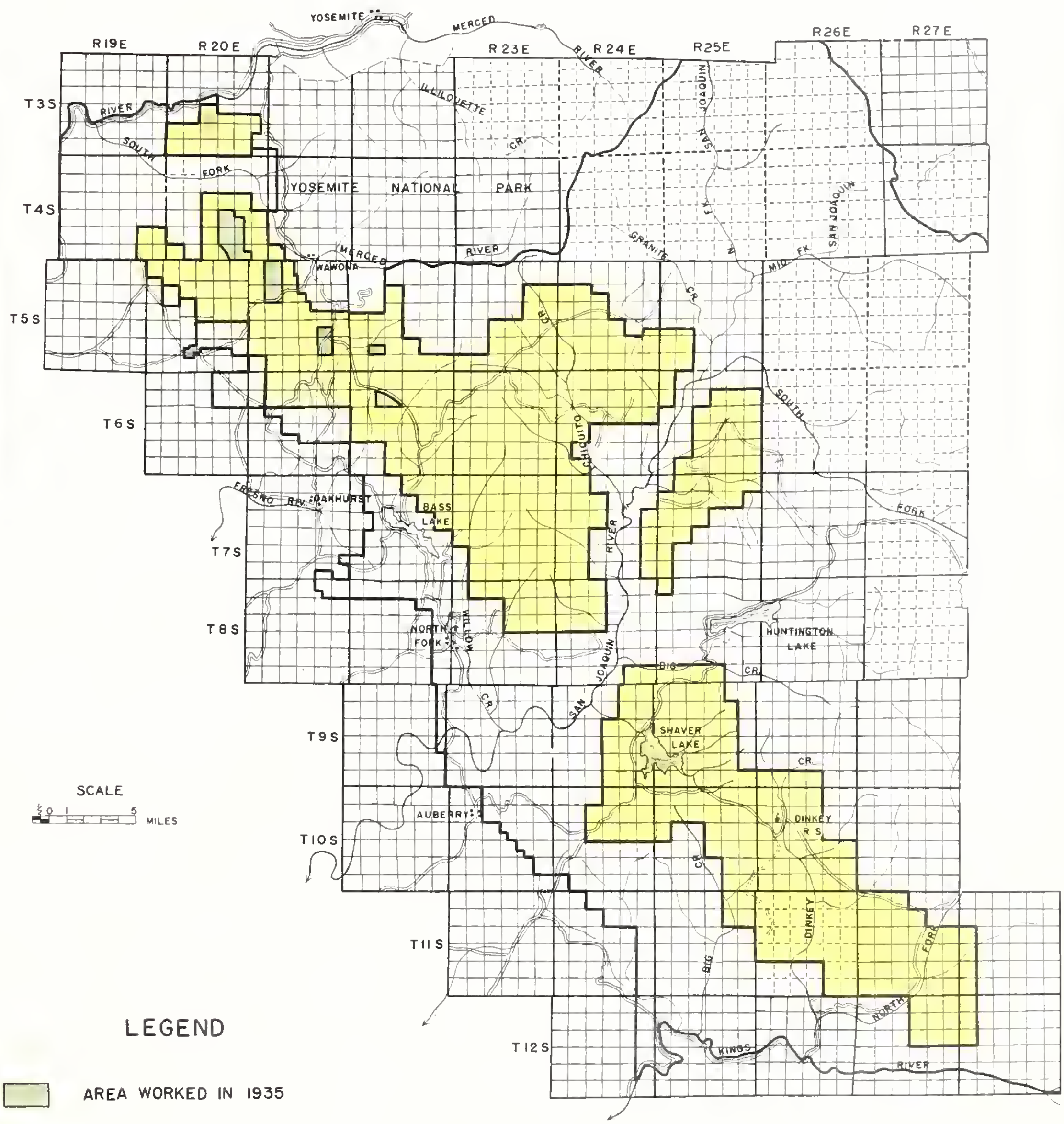
PROGRESS OF BLISTER RUST CONTROL

ON THE

SIERRA NATIONAL FOREST



LEGEND

AREA WORKED IN 1935

AREAS REMAINING TO BE WORKED

ANNUAL REPORT 1935
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TRACED BY C FOWLER APRIL 1935
FROM 1/4" FOREST SERVICE BASE MAP

TABLE NO. 1

SUMMARY OF RIBES ERADICATION BY CONTROL UNITS
CALIFORNIA, 1935

Class of Eradication	Control Unit	Acres Covered: Worked By Crews	Acres Covered: Blocked Out	Acres Covered: Total	Effective Man Days	Total Ribes Eradicated	Total Costs	Per Acre: Ribes	Per Acre: Costs
Initial	Plumas National Forest	23,597	5,034	28,631	12,383	2,970,607	$ 87,374.41	104	$3.05
	Eldorado National Forest	15,948	3,048	18,996	9,063	2,749,979	71,673.18	145	3.77
	Stanislaus National Forest	18,911	318	19,229	10,154	3,851,248	68,621.84	200	3.57
	Sierra National Forest	6,053		6,053	11,511	2,822,688	78,214.15	466	12.92
	Total	64,509	8,400	72,909	43,111	12,394,522	305,883.58	170	4.20
Reeradication	Plumas National Forest	390		390	250	96,452	1,764.01	247	4.52
	Stanislaus National Forest	895		895	506	73,558	3,419.65	82	3.82
	Total	1,285		1,285	756	170,010	5,183.66	132	3.98
Grand Total Initial and Reeradication		65,794	8,400	74,194	43,867	12,564,532	$311,067.24	169	$4.19

TABLE NO. 2

SUMMARY OF RIBES ERADICATION BY TYPES - CALIFORNIA, 1935

Class of Eradication	Control Unit	Eradication Type	Acres Covered	Effective Man Days	Ribes Eradicated	Costs	Per Acre Basis M. D.	Per Acre Basis Ribes	Per Acre Basis Costs
Initial	Plumas National Forest	Timber	22,513	6,684	1,609,079	$ 47,162.28	0.30	71	$2.09
		Cut Over	5,330	4,028	1,133,813	28,421.56	0.76	213	5.33
		Brush	507	659	175,732	4,649.90	1.30	347	9.17
		Inerme Slash	51	736		5,193.21	14.43		101.82
		Stream	230	276	51,983	1,947.46	1.20	226	8.46
		Total	28,631	12,383	2,970,607	87,374.41	0.43	104	3.05
	Eldorado National Forest	Timber	12,531	4,875	1,485,667	38,553.31	0.39	119	3.08
		Cut Over	5,845	3,549	1,075,973	28,066.45	0.61	184	4.80
		Stream	620	639	188,339	5,053.42	1.03	304	8.15
		Total	18,996	9,063	2,749,979	71,673.18	0.48	145	3.77
	Stanislaus National Forest	Timber	13,658	4,182	638,947	28,262.41	0.31	47	2.07
		Cut Over	4,701	5,180	2,974,130	35,007.01	1.10	633	7.45
		Brush	362	352	94,937	2,378.85	0.97	262	6.57
		Stream	508	440	143,234	2,973.57	0.87	282	5.85
		Total	19,229	10,154	3,851,248	68,621.84	0.53	200	3.57
	Sierra National Forest	Timber	2,522	2,963	602,773	20,132.73	1.17	239	7.98
		Cut Over	3,316	7,292	1,916,689	49,547.18	2.20	578	14.94
		Stream	215	1,256	303,226	8,534.19	5.84	1,410	39.69
		Total	6,053	11,511	2,822,688	78,214.15	1.90	466	12.92
	Total Initial	Timber	51,224	18,704	4,336,466	134,110.78	0.37	85	2.62
		Cut Over	19,192	20,049	7,100,605	141,042.20	1.07	370	7.35
		Brush	869	1,011	270,669	7,028.75	1.16	311	8.09
		Inerme Slash	51	736		5,193.21	14.43		101.82
		Stream	1,573	2,611	686,782	18,508.64	1.66	437	11.77
		Total	72,909	43,111	12,394,522	305,883.58	0.59	170	4.20
Reeradication	Plumas N.F.	Inerme Slash	390	250	96,452	1,764.01	0.64	247	4.52
	Stanislaus National Forest	Cut Over	840	472	65,389	3,189.85	0.56	78	3.80
		Stream	55	34	8,169	229.80	0.62	149	4.18
		Total	1,285	756	170,010	5,183.66	0.59	132	4.03
	Grand Total Initial and Reeradication	Timber	51,224	18,704	4,336,466	134,110.78	0.37	85	2.62
		Cut Over	20,032	20,521	7,165,994	144,232.05	1.01	358	7.20
		Brush	869	1,011	270,669	7,028.75	1.16	311	8.09
		Inerme Slash	441	986	96,452	6,957.22	2.24	219	15.78
		Stream	1,628	2,645	694,951	18,738.44	1.62	427	11.51
		Total	74,194	43,867	12,564,532	$311,067.24	0.59	169	$4.19

TABLE NO. 3

SUMMARY OF RIBES ERADICATION BY OWNERSHIP - CALIFORNIA, 1935

Class of Eradication	Control Unit	Ownership	Total Area Covered		Total Effective Man Days	Total Ribes Eradicated	Total Cost of Operation
			Acres	Percent			
Initial	Plumas National Forest	Federal	8,830	31	3,839	920,888	$ 27,087.97
		Private	19,801	60	8,544	2,049,719	60,286.44
		Total	28,631	100	12,383	2,970,607	87,374.41
	Eldorado National Forest	Federal	9,371	49	3,717	1,000,663	29,395.26
		Private	9,625	51	5,346	1,749,316	42,277.92
		Total	18,996	100	9,063	2,749,979	71,673.18
	Stanislaus National Forest	Federal	6,439	37	3,757	1,424,962	25,390.22
		Private	12,700	63	6,397	2,426,286	43,231.62
		Total	19,229	100	10,154	3,851,248	68,621.84
	Sierra National Forest	Federal	5,795	96	11,020	2,702,441	74,877.93
		Private	258	4	491	120,247	3,336.22
		Total	6,053	100	11,511	2,822,688	78,214.15
	Total	Federal	30,435		22,333	6,048,954	156,751.38
		Private	42,474		20,778	6,345,568	149,132.20
		Total	72,909	100	43,111	12,394,522	305,883.58
Reeradication	Plumas	Federal	240	62	154	59,800	1,086.62
		Private	150	38	96	36,652	677.39
		Total	390	100	250	96,452	1,764.01
	Stanislaus	Federal	895	100	506	73,558	3,419.65
		Private					
		Total	895	100	506	73,558	3,419.65
	Total	Federal	1,135	62	660	133,358	4,506.27
		Private	150	38	96	36,652	677.39
		Total	1,285	100	756	170,010	5,183.66
Grand Total Initial and Reeradication		Federal	31,570		22,993	6,182,312	161,257.65
		Private	42,624		20,874	6,382,220	149,809.59
		Total	74,194		43,867	12,564,532	$311,067.24

TABLE NO. 4

TOTAL NUMBER OF RIBES ERADICATED BY SPECIES, CALIFORNIA, 1935

Class of Eradication	Control Unit	Eradication Type	R. roezli Number of Bushes	R. roezli % of Total	R. neva. No. of Bushes	R. neva. % of Total	R. cereum No. of Bushes	R. cereum % of Total	R. visc. No. of Bushes	R. visc. % of Total	R. inerme No. of Bushes	R. inerme % of Total	Total Bushes
Initial	Plumas National Forest	Timber	1,421,832	89	159,495	10	1,011		26,375	1	366		1,609,079
		Cut Over	1,090,611	96	34,836	3	1,606		6,760	1			1,133,813
		Brush	174,294	99	1,438	1							175,732
		Stream	32,389	62	18,389	35			19		1,186	3	51,983
		Total	2,719,126	91	214,158	7	2,617		33,154	2	1,552		2,970,607
	Eldorado National Forest	Timber	1,409,621	95	28,250	2	30,169	2	17,627	1			1,485,667
		Cut Over	1,060,770	99	15,164	1	39						1,075,973
		Stream	164,113	87	23,266	12	655	1	305				188,339
		Total	2,634,504	96	66,680	2	30,863	1	17,932	1			2,749,979
	Stanislaus National Forest	Timber	598,082	93	23,482	4	14,541	2	2,842	1			638,947
		Cut Over	2,912,988	98	54,106	1	3,986	0.5	3,050	0.5			2,974,130
		Brush	94,427	99	438	1	72						94,937
		Stream	112,508	79	30,285	21	381		60				143,234
		Total	3,718,005	96	108,311	3	18,980	0.7	5,952	0.3			3,851,248
	Sierra National Forest	Timber	585,690	97	17,083	3							602,773
		Cut Over	1,709,629	89	207,052	11			8				1,916,689
		Stream	148,598	49	154,628	51							303,226
		Total	2,443,917	86	378,763	14			8				2,822,688
	Total Initial Eradication	Timber	4,015,225	93	228,310	5	45,721	1	46,844	1	366		4,336,466
		Cut Over	6,773,998	95	311,158	4	5,631	0.4	9,818	0.6			7,100,605
		Brush	268,721	99	1,876	1	72						270,669
		Stream	457,608	66	226,568	33	1,036	0.4	384		1,186	0.6	686,782
		Total	11,515,552	93	767,912	6	52,460	0.5	57,046	0.5	1,552		12,394,522
Reeradication	Plumas	Inerme Slash	686	1	581	1					95,185	98.	96,452
	Stanislaus	Cut Over	57,472	87	7,820		97						65,389
		Stream	3,799	47	4,366	53	4						8,169
		Total	61,957	36	12,767	8	101				95,185	56.	170,010
Grand Total Initial and Reeradication		Timber	4,015,225	93	228,310	5	45,721	1	46,844	1	366		4,376,466
		Cut Over	6,831,470	95	318,978	4	5,728	0.4	9,818	0.6			7,165,994
		Brush	268,721	99	1,876	1	72						270,669
		Inerme Slash	686	1	581	1					95,185	98.	96,452
		Stream	461,407	66	230,934	33	1,040	0.4	384		1,186	0.6	694,951
		Total	11,577,509	92	780,679	6	52,561	0.5	57,046	0.5	96,737	1.	12,564,532

STATEMENT OF COSTS

An accounting of funds spent and the cost of the work subdivided into its component parts are given in tables Nos. 5 to 8. All costs are included, both those of the field operations and those of the Oakland office.

It should be recognized that the per acre costs of Ribes eradication as shown in tables Nos. 1 and 2 are not normal. This is in part caused by the proportionally large number (31,666) of facilitating man days compared with the number (43,867) of man days actually spent on Ribes eradication (effective man days). The facilitating man days include not only the time of the usual supervisory force of unit supervisors, checking supervisors, camp foremen, straw bosses, checkers, and clerical assistants, but also all time lost because of inclement weather which according to WPA regulations was paid time, and all time spent on jobs other than Ribes eradication, such as road and trail building and improvement, woodcutting, camp details, etc. Other factors contributing to an abnormal cost were the relatively short field season with its late start and consequent necessity of operating late in the season under adverse working conditions, the various limitations imposed on WPA projects and a heavy labor turnover, together with a type of labor generally less efficient than that formerly used.

TABLE NO. 5

EXPENDITURES BY APPROPRIATIONS
JANUARY 1 TO DECEMBER 31, 1935 - CALIFORNIA

Appropriation	Amount
NIRA, EPQ share joint fund disbursed by F. S.	$ 10,562.18
Forest Service fund used on blister rust work	7,082.43
NIRA disbursed by EPQ	47,330.52
Regular disbursed by EPQ	15,926.86
WPA disbursed by Treasury Office, San Francisco	270,317.46
Total expenditures	$351,219.45

TABLE NO. 6

CLASSIFIED EXPENDITURES BY APPROPRIATIONS
JANUARY 1 TO DECEMBER 31, 1935 - CALIFORNIA

Item	EQ Portion of Joint Fund	FS Cooperative Funds	EQ NIRA	EQ Regular	EQ WPA	Total
1. Salaries - permanent	$ 1,949.91	$ 1,285.51	$25,374.87	$15,366.35	$ 9,166.39	$ 53,143.03
2. Wages - temporary	627.00		1,214.49	66.00	164,171.28	166,078.77
3. Equipment - non-exp. and semi-exp.	5,444.69	5,689.63	6,440.69	85.30	18,854.43	36,514.74
4. Subsistence supplies	11.30		1,116.83	123.88	62,922.42	64,174.43
5. Other Supplies and Expenses	1,557.87	18.89	10,072.48	54.14	8,387.59	20,090.97
6. Transportation and Travel	971.41	88.40	3,111.16	231.19	6,815.35	11,217.51
Total Expenditures	$10,562.18	$ 7,082.43	$47,330.52	$15,926.86	$270,317.46	$351,219.45

TABLE NO. 7

TABLE NO. 7

COST OF CALIFORNIA ERADICATION PROJECTS
1935

Item		Plumas	Sierra	Eldorado	Stanislaus	Total
Salaries - permanent		$ 6,677.64	$ 6,884.34	$ 8,739.58	$ 7,785.53	$ 30,087.09
Wages - temporary		47,536.87	40,094.67	36,454.83	34,618.60	158,704.97
Equipment		9,080.83	9,080.82	9,080.81	9,080.79	36,323.25
Subsistence		20,609.66	16,133.26	13,062.50	13,665.94	63,471.36
Other supplies and expenses		4,175.59	5,069.10	3,001.56	3,588.40	15,834.65
Transportation and travel		2,320.23	1,761.41	2,219.48	2,561.25	8,862.37
Total of items directly chargeable to eradication projects		90,400.82	79,023.60	72,558.76	71,300.51	313,283.69
Plus	Pro rata share of cost of Oakland office	3,349.16	3,349.16	3,349.16	3,349.16	13,396.64
	1/3 cost of equipment purchased: 1933	597.44	597.44	597.44	597.45	2,389.76
	1934	3,689.08	3,689.08	3,689.08	3,689.07	14,756.32
	Supplies on hand 1/1/35	421.32		406.29	650.42	1,478.03
Gross costs of 1935 operation		98,457.82	86,659.28	80,600.73	79,586.61	345,304.44
Less	2/3 cost of equipment purchased 1935	6,053.88	6,053.88	6,053.87	6,053.87	24,215.50
	Supplies on hand 12/31/35: Twine	1,391.25	1,391.25	1,391.25	1,391.25	5,565.00
	Food	1,874.27	1,000.00	1,482.43	100.00	4,456.70
Net cost of 1935 operation		$89,138.42	$78,214.15	$71,673.18	$72,041.49	*$311,067.24

* The pro rata charges of the Oakland office charged to Scouting, Reconnaissance and the Oregon operation, plus the costs directly chargeable to Scouting, Reconnaissance and the chemical unit are not included in this figure.

TABLE NO. 8

MEAL COSTS, CALIFORNIA, 1935

Item	Plumas	Eldorado	Stanislaus	Sierra	Total
Food	$18,735.39	$11,580.17	$13,565.94	$15,133.26	$59,014.76
Kitchen help	5,441.90	4,243.79	3,459.76	5,730.01	18,875.46
Transportation	1,247.99	1,208.31	798.07	1,699.05	4,953.42
Total	25,425.28	17,032.27	17,823.77	22,562.32	82,843.64
Amount paid by men for meals	$10,179.38	$ 7,229.93	$ 7,198.18	$ 8,526.44	$33,133.93
Deficit					
Total meals served	95,706	65,267	63,788	80,793	305,554
Average cost per meal	$ .266	$ .261	$ .279	$ .279	$ .271
Average deficit per meal	.160	.150	.166	.174	.163

CHECKING

The objectives of the checking work as performed in the 1935 season were: (1) the inspection of areas following Ribes eradication to obtain the distribution, the number, and the feet of live stem of Ribes remaining, and (2) the inspection of areas low in Ribes population prior to eradication to show the distribution and number of bushes present for the purpose of eliminating such areas from crew work. Work performed under objective (1) is designated regular check, and is subdivided into upland check and stream type check and recheck, which is a reexamination of either upland or stream; work under objective (2) is designated advance check.

This was the first year that checking was conducted by a separate organization functioning independently of the eradication forces. In the past the work had been handled by a checking foreman on each forest taking orders from and being wholly responsible to the eradication operation supervisor. In 1935 a checking division under the leadership of a regional checking supervisor, responsible directly to the regional leader was established to handle the work for the sugar pine region (California and Oregon). On each operation a checking supervisor administered the work assisted by a number of appointed checkers.

On some of the operations where there were insufficient checkers to handle the work, a few security wage workers were assigned checking duties. This was, however, a very unsatisfactory practice because of the lack of intelligence, education and ability on the part of the security wage men which rendered their work ineffective.

The methods used in performing checking work are set forth in detail in the checking manual which was completely rewritten in the spring of 1935. Procedures had been improved and clarified, new ones described, new forms and field

maps evolved, and personnel relations defined, all of which proved an effective guide for the 1935 work. The check is based on the sampling method embodying the use of the strip composed of consecutive transects, one chain long by one-quarter chain wide. Strips are spaced at intervals of six chains which yield not less than a four percent check (see tables No. 1 and 1A).

At the beginning of the season when there was little checking to be done, and to some extent throughout the season, the checking personnel assisted in the conduct of eradication work. When thus engaged, their principal duties were stringing block boundaries, guiding crews to rework blocks, drafting eradication maps and camp construction and dismantling. In the middle of August when the field work had barely begun the regional checking supervisor was called to the Oakland office to assist there in the many administrative duties that were pressing at that time and since he was not able to leave Oakland during the rest of the season was thus removed from any active supervision of checking in the field. He continued, however, to administer the work as well as the disadvantage of distance would allow and received all checking reports. The work on the Stanislaus was seriously handicapped by the untimely death on August 13 of E. E. Smith, checking supervisor, whose place was successively filled by two men acting as supervisors.

From table No. 9 it is seen that out of a total of 47,743 acres checked in California 37,977 (80%) meet the standard of control with 1.6 bushes and 6.4 feet of live stem per acre, while the difference of 9,766 acres (20%) averages 10 bushes and 99 feet of live stem.

Table No. 10 shows that nearly one-half of the acreage advance checked is eliminated from crew work as a result of that check.

The data in table No. 12 indicate that successive rechecks increase proportionally in cost; thus an initial check costs an average of 8.8¢ an acre, but a second check costs 9¢, a third check 11.3¢, and a fourth check 14¢.

Recommendations for future work

1. That the number of appointed checkers hired be sufficient to handle the total volume of checking work. Twenty thousand eight hundred sixty-eight acres covered by eradication in 1935 must be checked in 1936 besides a considerable amount of acreage which will be reworked by eradication.

2. That the camp foremen and the other eradication supervisory personnel be thoroughly instructed in the purposes and methods of checking, the uses and interpretation of checking data and control standards.

3. That before areas are declared ready for checking they be examined by a responsible eradication man to determine whether there is a reasonable probability of their meeting the standard of control. This will eliminate needless and expensive rechecks.

4. That the reworking of areas by eradication be not delayed until a large amount has accumulated, but that rework follow closely upon checking.

5. That advance check be requested only on areas supporting few Ribes, and of which it may be expected a good share can be eliminated from crew work; con-

maps evolved, and personnel relations defined, all of which served as [illegible] guide for the 1935 work. The check is based on the sampling method [illegible] use of the strip composed of consecutive transects, one chain long by [illegible] chain wide. Strips are spaced at intervals of six chains [illegible] a four percent check (see tables No. 1 and 14).

At the beginning of the season when there was little checking to be done, and to some extent throughout the season, the checking personnel assisted in the conduct of eradication work. When thus engaged, their principal duties were stringing block boundaries, guiding crews to rework blocks, drafting [illegible] maps and camp construction and dismantling. In the middle of [illegible] work had barely begun the regional checking supervisor was called to the [illegible] office to assist there in the many administrative duties that [illegible] that time and since he was not able to leave [illegible] during the rest of the season was thus removed from any active supervision of checking in the field. He continued, however, to administer the work as well as the [illegible] would allow and received all checking reports. The work [illegible] seriously handicapped by the untimely death on August 17 of [illegible] supervisor, whose place was successfully filled by [illegible].

From table No. 2 it is seen that out of a total of [illegible] acres checked in California 37,277 (80%) meet the standard of control [illegible] feet of live stem per acre, while the difference of [illegible] acres (20%) [illegible] 10 bushes and 29 feet of live stem.

Table No. 10 shows that nearly one-half of all [illegible] is eliminated from crew work as a result of these checks.

The data in table No. 12 indicate that successive [illegible] portionally in cost; thus an initial check costs an average of [illegible] a second check costs [illegible], a third check [illegible], and a fourth check [illegible].

Recommendations for future work

1. That the number of principal checkers hired be sufficient to handle the total volume of checking work. Twenty thousand eight hundred [illegible] acres covered by eradication in 1935 must be checked in 1936 besides a considerable amount of acreage which will be reworked by eradication.

2. That the camp foremen and the other eradication supervisory personnel be thoroughly instructed in the purposes and methods of checking, the [illegible] interpretation of checking data and control standards.

3. That before areas are declared ready for checking they be examined by the responsible eradication man to determine whether there is a reasonable likelihood of their meeting the standard of control. This will eliminate needless and expensive rechecks.

4. That the reworking of areas by eradication be not delayed until a large amount has accumulated, but that rework follow closely upon checking.

5. That advance check be conducted only in areas [illegible] of which it may be expected a good check can be eliminated [illegible]

versely that all areas of extremely low Ribes population be advance checked.

6. That advance checking data be interpreted carefully in order that the largest possible area be eliminated from crew work, and vice versa, that areas be eliminated only when the data justify it.

7. That checkers be assigned eradication duties only in case of urgent need or when regular checking work is wanting and that they be not used for tasks that can be performed as effectively by security wage workers.

8. That security wage workers of the general laboring group be not used as checkers. They have neither the requisite intelligence nor the education to handle the work satisfactorily and their use introduces a difference in wage rates which induces dissatisfaction both among themselves and among the regular appointed checkers.

TABLE NO. 9

SUMMARY OF REGULAR CHECKING RESULTS - SUGAR PINE REGION, CALIFORNIA
SEASON OF 1935

National Forest	Eradication Type	Acres Covered By Eradication	Acres Covered by Check	Percent of Check	Man Days	Areas Averaging Less Than 25 F.L.S.** Per Acre			Areas Averaging More Than 25 F.L.S. Per Acre			Acres Unchecked
							Ribes Per Acre			Ribes Per Acre		
						Acres	Bushes	F.L.S.	Acres	Bushes	F.L.S.	
Plumas	Timber	17,609	15,080	4.2	229-6/8	11,248	.9	4.1	3,832	8.4	86.6	2,529
	Cut Over	5,200	4,614	4.3	72-3/8	3,527	.8	5.2	1,087	7.0	124.2	586
	Brush	507	504	4.5	9	175	1.4	4.5	329	15.2	154.2	3
	R. inerme	441	33	12.5	2-3/8	33	1.5	16.0				408
	Stream	230	165	25.8	16-1/8	145	2.8	21.7	20	14.1	151.4	65
	All Types	23,987	20,396	4.5	329-4/8	15,128	1.0	5.4	5,268	8.7	99.4	3,591
Eldorado	Timber	11,011	7,948	4.1	110	6,472	1.5	8.4	1,476	9.2	72.0	3,063
	Cut Over	4,317	3,166	4.5	53-6/8	2,441	1.1	2.4	725	6.4	63.1	1,151
	Stream	620	342	17.9	21	318	2.4	10.4	24	11.2	88.3	278
	All Types	15,948	11,456	4.6	184-6/8	9,231	1.5	7.2	2,225	8.3	69.0	4,492
Stanislaus	Timber	13,438	8,336	4.1	114-6/8	8,100	1.3	5.1	236	11.1	38.2	5,102
	Cut Over	5,541	1,609	4.3	40	1,390	1.3	5.4	219	5.2	58.9	3,932
	Brush	264	97	3.1	4-5/8	77	2.0	9.5	20	16.0	110.0	167
	Stream	563	338	14.2	27-5/8	336	5.9	12.9	2	4.0	33.0	225
	All Types	19,806	10,380	4.4	187	9,903	1.9	6.2	477	8.3	50.6	9,426
Sierra	Timber	2,522	2,322	4.3	43-5/8	1,584	1.2	6.2	738	15.5	186.0	200
	Cut Over	3,316	2,981	4.2	80-4/8	1,975	4.9	9.9	1,006	14.8	108.5	335
	Stream	215	208	16.6	24-7/8	156	10.6	13.7	52	25.5	166.4	7
	All Types	6,053	5,511	4.7	149	3,715	4.1	9.0	1,796	16.5	145.9	542
All Forests	Timber	44,580	33,686	4.2	498-1/8	27,404	1.2	5.5	6,282	9.5	93.0	9,385
	Cut Over	18,374	12,370	4.3	246-5/8	9,333	1.8	5.5	3,037	9.3	99.7	6,008
	Brush	771	601	4.3	13-5/8	252	1.6	6.0	349	15.2	151.7	170
	R. inerme	441	33	12.5	2-2/8	33	1.5	16.0				408
	Stream	1,628	1,053	17.7	89-5/8	955	5.0	13.5	98	19.2	141.5	412
	All Types	65,794	47,743	4.5	850-2/8	37,977	1.6	6.4	9,766	10.0	98.6	*18,051

* Includes 2,370 acres checked, subsequently reworked but not rechecked.
** F. L. S. - feet of Ribes live stem.

TABLE NO. 10

SUMMARY OF ADVANCE CHECKING RESULTS
CALIFORNIA - SEASON OF 1935

National Forest	Eradication Type	Acres Covered by Advance Check	Man Days	Area Eliminated From Crew Work			
				Acres	Percent Check	Ribes Per Acre	
						Bushes	F.L.S.
Plumas	Timber	9,779	140-6/8	4,904	4.9	0.3	1.8
	Cut Over	423	6-6/8	130	5.0	0.9	10.2
	Total	10,202	147-4/8	5,034	4.9	0.3	2.0
Eldorado	Timber	2,895	21	1,520	4.9	0.4	5.0
	Cut Over	3,068	28	1,528	5.6	1.1	12.2
	Total	5,963	49	3,048	5.2	0.8	8.8
Stanislaus	Timber	668	14-4/8	220	4.5	0.4	1.8
	Cut Over	60	1-2/8				
	Brush	98	5-2/8	98	4.0	0.0	0.0
	Total	826	21	318	4.4	0.03	0.1
Totals for All Forests	Timber	13,342	176-2/8	6,644	4.9	0.3	2.5
	Cut Over	3,551	36	1,658	5.5	1.1	12.0
	Brush	98	5-2/8	98	4.0	0.0	0.0
	Grand Total	16,991	217-4/8	8,400	5.0	0.5	4.3

N. B. No advance check performed on the Sierra National Forest.

TABLE NO. 11

COSTS AND CLASSIFICATION OF CHECKING TIME
SUGAR PINE REGION, CALIFORNIA - SEASON OF 1935

National Forest	Item	Regular Checking	Advance Checking	All Checking	Eradication	Totals
Plumas	Man Days	327-7/8	232-1/8	560	157	717
	Cost	$2,059.92	$ 919.62	$ 2,979.54	$ 835.35	$3,814.89
	Percent of Total Man Days	54.0	24.1	78.1	21.9	100.0
	Acres per man day	78.5	44.0	64.2		
	Cost per acre	$ 0.101	$ 0.090	$ 0.083		
Eldorado	Man Days	223-5/8	78-3/8	302	185	487
	Cost	$1,224.00	$ 425.00	$ 1,649.00	$1,042.00	$2,691.00
	Percent of Total Man Days	45.5	15.8	61.3	38.7	100.0
	Acres per man day	64.7	76.1	67.6		
	Cost per acre	$ 0.107	$ 0.071	$ 0.081		
Stanislaus	Man Days	247-6/8	28-2/8	276	41	317
	Cost	$1,070.86	$ 120.90	$ 1,191.76	$ 177.04	$1,368.80
	Percent of Total Man Days	78.2	8.8	87.1	12.9	100.0
	Acres per man day	61.4	29.2	58.1		
	Cost per acre	$ 0.103	$ 0.146	$ 0.074		
Sierra	Man Days	155-4/8		155-4/8	126-4/8	282
	Cost	$ 883.82		$ 883.82	$ 719.04	$1,602.86
	Percent of Total Man Days	55.1		55.1	44.9	100.0
	Acres per man day	48.1		48.1		
	Cost per acre	$ 0.160		$ 0.118		
Summary of All Forests	Man Days	954-6/8	338-6/8	1,293-4/8	509-4/8	1,803
	Cost	$5,238.60	$1,465.52	$ 6,704.12	$2,773.43	$9,477.55
	Percent of Total Man Days	53.0	18.8	71.8	28.2	100.0
	Acres per man day	65.8	50.2	61.7		
	Cost per acre	$ 0.110	$ 0.086	$ 0.084		

N.B. The cost per acre of regular checking is computed on the basis of acreage checked, i.e., rechecked acreages are not included; on the contrary, the cost per acre of all checking is based on the acreage of all checks--advance, regular and rechecks (first, second, third, etc.), so that the result is the cost of performing a single check upon an average acre.
The cost of eliminating an acre from crew work by means of advance check is 18 cents for the Plumas, 14 cents for the Eldorado, and 38 cents for the Stanislaus, an average of 17 cents.

TABLE NO. 12

ANALYSIS OF REGULAR CHECKING CALIFORNIA AND OREGON - 1935

Eradication Type	Number of Check														
	First			Second			Third			Fourth			Total		
	Man Days	Acres	Cost per Acre	Man Days	Acres	Cost per Acre	Man Days	Acres	Cost per Acre	Man Days	Acres	Cost per Acre	Man Days	Acres	Cost per Acre
Timber	591-3/8	48,077	$.076	98-3/8	8,348	$.072	14-5/8	975	$.092	5/8	55	$.07	705	57,455	$.075
Cut Over	207-6/8	15,407	.083	35-5/8	2,402	.091	8-7/8	543	.10	3-7/8	230	.103	256-1/8	18,582	.085
Brush	14-2/8	806	.108	6-4/8	349	.114	1-2/8	51	.15				22	1,206	.112
R. inerme	2-3/8	33	.442										2-3/8	33	.442
Stream	142-7/8	2,217	.396	27-5/8	420	.404	5	49	.627	2-3/8	16	.911	177-7/8	2,702	.404
Total	958-5/8	66,540	$.088	168-1/8	11,519	$.09	29-6/8	1,618	$.113	6-7/8	301	$.14	1,163-3/8	79,978	$.089

N. B. On the basis of acreages the second check is 17 percent of the first, the third 2 percent, and the 4th plus 1/2 of one percent.

CONTROL RECONNAISSANCE IN CALIFORNIA, 1935

By
D. R. Miller
Associate Forester.

INTRODUCTION

The greater portion of the important sugar pine stands of the Plumas, Eldorado and Stanislaus National Forests had been covered by control reconnaissance previous to 1935. There were small areas on each forest that had not been covered and information on these units was needed for current eradication purposes as well as to further the general sugar pine survey of California, started in 1932.

Reconnaissance was performed during the spring and early summer but was discontinued as soon as the eradication activities started towards the end of July.

DESCRIPTION

A detailed description of the conditions on the Stanislaus was given in the 1927 Annual Report, the one for the Plumas was given in the 1928 Annual Report and the one for the Eldorado was given in the 1930 Annual Report.

The area covered on the Plumas was in the Fall River drainage, which lies in the southern end of the forest. The timber from about fifty percent of the worked acreage had been cut between eight and fifteen years ago. On the Eldorado work was performed on the southern end of the forest in the Consumnes and the North Fork of the Mokelumne River drainages. About fifty percent of the area had been cut over from one to forty years ago. Reconnaissance on the Stanislaus was confined to the Clavey River drainage which lies in the central portion of the forest. The timber on most of this area was cut from fifteen to twenty-five years ago.

PERSONNEL

The work was performed by permanent members of the Division of Plant Disease Control while in the field making preparations for the summer's work. Only a part of each man's time was spent in running strips. There was a five-man party on the Plumas, a three to eight-man party on the Eldorado and a six-man party on the Stanislaus.

METHODS OF WORK

The mechanical methods used in collecting data and in making the type maps were the same as those used in 1934, with two exceptions, which are:

(1) Sugar pine seedlings were counted on continuous strips for all types instead of certain portions of cut-over type. These strips were the same as those used in taking Ribes data.

(2) In timber data sugar pine trees were divided into two diameter classes (0" to 8" and 8" plus) instead of four diameter classes. Timber types used in 1935 were the same as those described in the 1934 Annual Report.

The compilation of data and permanent records were handled in the same way as in 1934.

WORK PERFORMED AND RESULTS OBTAINED

The results of reconnaissance performed in 1935 are given in the following tables:

TABLE NO. 1

SECTIONS WORKED IN WHOLE OR IN PART
CALIFORNIA RECONNAISSANCE 1935

Meridian	T.	R.	Section	Totals No.	Totals Acres
			Part A - Plumas National Forest		
Mount Diablo	20N	7E	2,3,4	3	1,920
	21N	7E	24,25,26,27,28,29,30,33,34,35,36	11	5,880
	21N	8E	30	1	320
Totals				15	8,120
			Part B - Eldorado National Forest		
Mount Diablo	8N	14E	3,4,5,6,8,9,10,11,13,14,15,16,21,22,23, 24,25,26,27,28,33,34,35,36,	24	15,515
	8N	15E	5,7,8,17,18	5	2,560
	9N	13E	1,12	2	1,280
	9N	14E	6,7,8,9,10,16,17,18,19,20,21,22,23,25,26 27,28,29,30,31,32,33,34,35,36	25	16,188
	9N	15E	30,31	2	1,280
	10N	14E	8,9,16,20,21,28,33,34	8	5,120
Totals				66	41,943
			Part C - Stanislaus National Forest		
Mount Diablo	3N	18E	19,20,28,29,30,31,32,33	8	4,760
	3N	17E	25,26,27,28,33,34,35,36	8	5,120
	2N	18E	6	1	640
	2N	17E	1,2,3,4,8,9,10,11,12,14,15,16,17,21,22, 23,24,26,27,28,33,34,35	23	13,960
	1N	17E	2,3,4,9,10,11,12,14,15,16,21,22,23,27,28	14	8,640
Totals				54	33,120
Grand Total				135	83,183

TABLE NO. 2

RIBES ANALYSIS OF AREAS COVERED
CALIFORNIA RECONNAISSANCE 1935

Type	Acres		Ribes Per Acre			
	Number	% of Total	R. roez.	R. neva.	R. visco.	All Species
Part A - Plumas National Forest						
SY	1,464	18.0	58.3	0.8		59.1
SY-CO	194	2.4	135.5			135.5
SF	2,120	26.2	81.2	1.7		82.9
SF-CO	147	1.8	106.3			106.3
Non-S	1,338	16.5	70.8	1.0		71.7
Non-S-CO	256	3.1	214.4	4.2		218.6
Brush	2,485	30.6	144.6	1.8		146.4
Stream	116	1.4	237.5	65.3		302.8
Tot. or Ave.	8,120	100.0	102.9	2.4		105.3
Part B - Eldorado National Forest						
SY	8,566	20.4	44.4	0.5		4[illegible].0
SY-CO	3,135	7.5	43.9	6.9		50.9
SF	6,972	16.6	95.2	1.6		96.8
SF-CO	3,301	7.9	186.8	6.5		193.3
Non-S	10,221	24.4	41.2	0.4		41.6
Non-S-CO	8,394	20.0	73.5	1.3		74.8
Brush	727	1.7	90.6	0.7		91.3
Stream	627	1.5	190.3	48.6		238.9
Tot. or Ave.	41,943	100.0	72.1	2.5		74.6
Part C - Stanislaus National Forest						
SY	5,511	16.6	10.7	0.2		10.9
SY-CO	4,435	13.4	102.2	1.3		103.5
SF	2,005	6.1	44.3	0.8		45.1
SF-CO	6,572	19.9	152.7	8.7	6.1	167.6
Non-S	3,459	10.4	36.6	1.9	0.4	38.9
Non-S-CO	9,733	29.4	129.7	1.6	0.5	131.8
Brush	1,213	3.6	187.2	5.6		192.8
Stream	194	0.6	89.4	40.5		121.9
Tot. or Ave.	33,120	100.0	97.8	2.9	1.4	102.2
Part D - Totals All Forests - California						
SY	15,541	18.7	33.8	0.4		34.2
SY-CO	7,762	9.3	79.4	3.4		82.8
SF	11,097	13.3	83.3	1.5		84.8
SF-CO	10,020	12.0	163.5	8.0	3.9	175.4
Non-S	15.018	18.1	42.9	0.7	0.1	43.7
Non-S-CO	18,383	22.2	105.4	1.4	0.3	107.1
Brush	4,425	5.3	147.3	2.8		150.1
Stream	937	1.1	178.3	48.9		227.2
Tot. or Ave.	83,183	100.0	85.4	2.8	0.5	87.7

STATEMENT OF COSTS

As all work was done by permanent personnel in conjunction with other work no cost per acre has been figured.

TABLE NO. 3

COST ANALYSIS

Classification	Cost	Percent of Total
Salaries, Permanent Men	$3,805.43	78.5
Subsistence Supplies	518.79	10.7
Transportation and Travel	524.45	10.8
Total	$4,848.67	100.0

SCOUTING FOR BLISTER RUST IN CALIFORNIA AND OREGON, 1935

by
George A. Root
Associate Pathologist

INTRODUCTION

The presence of the blister rust in Oregon for over ten years and its subsequent spread to the southern part of that state, has caused no end of speculation as to when it would be found in California.

Extensive and intensive scouting has been conducted in the northern part of California for at least eight years, but no signs of the disease have been found. These scouting programs have been of varied scope, according to the amount of funds which were available for this project. At no time have there been enough men employed over a long enough season to give reasonable assurance that the rust was or was not present in this state. The nearest approach to this, possibly, was in 1933 and 1934, when an average of six and four men, respectively, was assigned to this project for a good share of the scouting season, particularly in 1934. During this period considerable time was spent in southern Oregon.

In 1935, five men of the permanent personnel, with auto transportation, were assigned to scouting for one week in July, pending the commencement of the eradication program. On September 22, two men started on the scouting project and continued until November 2. During September the Division of Forest Pathology of the Bureau of Plant Industry at Portland, Oregon, assigned one man to scout an area in southern Oregon. A member of the Oregon blister rust force joined this man and the two spent a week on the work.

LOCATION OF WORK

As in the past years, the scouting centered in northern California and southern Oregon. With knowledge of the presence of the rust at several points in southern Oregon, an attempt was made to trace it from these sources to points farther south and ultimately into California. However, most of the scouting during 1935 took place in northern California. Owing to circumstances which necessitated the assignment of but a few men over a comparatively short scouting season, some territory which warranted inspection was not covered. This comprised the Warner Mountains region of northeastern California and the Marble Mountains area between the Klamath, Scott, and North Fork of the Salmon Rivers.

During a few days in June, the writer made an examination of the Mount Shasta area at a number of points where a Cronartium was found in 1934. Inspections were made on Little Castle Creek, the south slope of Mt. Bradley, and west of Mt. Shasta City, in the Sacramento River drainage. During the middle of July a reexamination of this general area, together with a portion of the McCloud and Pit River drainages, was made by a group of five scouts. In late September, two men covered this area again to ascertain if the rust might have entered at a later date. Careful inspection of Ribes and pines failed to reveal signs of infection on either host.

Following the scouting in the Mt. Shasta area, the work shifted to points farther north in California. Inspections were made in several drainages opening into the upper Shasta Valley north of Mt. Shasta City. Examinations of Ribes and

pines were made east of Yreka in the Goosenest area of the Klamath National Forest. This is in the range forming the continuity of the Cascades and Sierra Nevada. Although rather a dry area, there are many good associations of Ribes and pines. A large stand of Pinus albicaulis with considerable Ribes cereum was noted near Ball Mountains. Following this, the mountainous area west of Yreka was scouted between Scott Valley and the Klamath River. This is fairly good scouting country, with a considerable amount of R. cruentum, R. lobbii, R. klamathense, and R. sanguineum. With completion of the area west of Yreka, scouting was conducted west of Hilt on Hungry and Beaver Creeks, tributaries of the Klamath River. Good associations of pines with R. sanguineum and R. cruentum were found at many points.

As an infection in the upper Rogue River drainage in Oregon had been found in early September but only on R. bracteosum, it was thought best to confine most of the remaining season to the examination of this species in California. The nearest known R. bracteosum in this state to the upper Rogue River infection is on Middle Creek, a tributary of Horse Creek which runs into the Klamath River.

West of Middle Creek, scouting was done on Thompson Creek and on Indian Creek and the East Fork of this stream. These enter the Klamath River near Happy Camp. Particularly on the latter two streams, R. bracteosum is quite abundant with fair to good pine association.

Time did not permit much work in the vicinity of Orleans, the center of fair scouting country. However, inspections were made farther to the south and west in the vicinity of Willow Creek and the Hoopa Indian Reservation, where many good associations of pines and R. bracteosum were found. Willow Creek is about 70 miles south of the Oregon boundary and represents the southernmost point in the western section of California where inspections were made during 1935.

Intensive scouting took place in Del Norte County in the northwestern corner of the state. This has always been considered good scouting territory since the discovery of the rust in 1929 and 1931 in Curry County, Oregon, just north of Del Norte County. Many good pine and R. bracteosum associations occur in this county, which makes it seem logical that the rust will be found here before a great lapse of time.

With the knowledge that the rust had been found in Curry County in past years, some inspection work was conducted by Root and Day in the Brush Creek area of this county, where the rust was again found in 1935. An attempt to trace it farther south toward the California border brought negative results.

Likewise with rust known to be in the upper Umpqua drainage near City Creek Camp, scouting was performed by members of the Division of Forest Pathology and of the Blister Rust Control unit in Oregon, in the upper reaches of the Rogue River on Flat Creek, where the disease was found on R. bracteosum. This led to considerable inspection work in a southerly direction from this point but no further signs of the rust were found.

The numbers of Ribes and pines examined during 1935 according to regions are shown in Table No. 1.

TABLE NO. 1

NUMBER OF RIBES AND PINES, BY SPECIES, EXAMINED FOR BLISTER RUST

NORTHERN CALIFORNIA AND SOUTHERN OREGON, 1935

Host Species	Number of Host Plants Examined in Each Region				
	*Region 1	Region 2	Region 3	Region 4	All Regions
Ribes					
R. bracteosum	367	786	378		1,531
R. klamathense	32	623	269	42	966
R. cruentum	50	511	243	81	885
R. viscosissimum		374	84	117	575
R. binominatum		112	109		221
R. lacustre		162	87	62	311
R. lobbii		77	52		129
R. sanguineum	47	292	111		450
R. nevadense		341	65		406
R. inerme		78	30		108
R. cereum	26		9	75	110
R. aureum		43	32		75
R. velutinum		35		55	90
R. vulgare			18		18
All Ribes	522	3,434	1,487	432	5,875
Pines					
P. lambertiana	100	729	225		1,054
P. monticola	267	166	81	75	589
P. albicaulis				144	144
All Pines	367	895	306	219	1,787

*Region 1 - The coastal fog belt of northwestern California and southwestern Oregon.

Region 2 - The area of California and Oregon comprising the Siskiyou Mountains.

Region 3 - The general area east of the Siskiyou Mountains to the crests of the Cascades and Sierra Nevada.

Region 4 - The territory east of the summit of the Cascades and Sierra Nevada.

COST OF 1935 SCOUTING OPERATION

The following table gives an analysis of the costs of the scouting project in California. The time spent in Oregon was of such short duration as to preclude the compilation of any real cost figures for that state.

TABLE NO. 2

Item	EQ NIRA	EQ REG.	EQ WPA	Total
Salaries, permanent	1,608.72	2,133.32	-	$3,742.04
Salaries, temporary	94.47	66.00	157.52	317.99
Subsistence supplies	184.28	-	-	184.28
Office sup. & exp.	74.89	43.29	-	118.18
Transp. & travel	148.09	41.80	276.46	466.35
Total	2,110.45	2,284.41	433.98	4,828.84
*Pro rata share of overhead costs				2,188.99
Total amount charged to scouting				$7,017.83

*This represents 10% of the cost of maintenance of the Oakland office and warehouse.

RESULTS

Although no white pine blister rust was found in California during 1935, it was discovered at two points in southern Oregon.

Infection in the Upper Rogue River Drainage:

During the early part of September, Cronartium ribicola was found on Flat Creek, a tributary of the Rogue River, by members of the Division of Forest Pathology and of the blister rust contingent of the Oregon eradication project. The disease occurred on several R. bracteosum bushes in T. 30 S., R. 3 E., Sec. 22, Willamette meridian. It is in Jackson County, very close to the Douglas County line. No diseased pines were found in the vicinity, although there were good associations.

Infection on Brush Creek, Curry County:

The discovery of white pine blister rust on R. bracteosum on this creek in 1929 and 1931, respectively, has lent an interest to examine this area each succeeding year.

Not until 1935 was the disease found again. On October 20, Day and Root discovered three infected R. bracteosum bushes at identically the same site as in 1929. This is in T. 33 S., R. 15 W., Sec. 25, Willamette meridian. On October 28, the rust was found on R. bracteosum on Ball Mountain Creek and one of its tributaries in T. 33 S., R. 15 W., Sec. 19, Willamette meridian. These points were about three miles northeast of the infection on Brush Creek. On November 1, several infected R. bracteosum were found on Brush Creek, one mile south of the infection found on October 20.

The comparatively heavy infection on Ribes at all points in this region undoubtedly means pine infection at not a great distance. The nearest known pines to the area are about twelve miles to the east in the vicinity of Iron Mountain. An attempt was made to reach them, but inclement weather prevented.

A high prominence on the coast known as Humbug Mountain was scouted for pines but none was found. It is along the base of this mountain that some of the infected bushes were found.

COMMENTS AND RECOMMENDATIONS

Perhaps the most important feature of the scouting in 1935 was the discovery of rust in the upper Rogue River drainage. This point of infection is approximately 50 miles south of the City Creek Camp infection found in 1934, and about 65 miles north of the California boundary in the Cascade region.

Second in interest, is the recurrence of the rust on Brush Creek and vicinity. This infection on the Oregon coast warrants an intensive scouting program of the lower Rogue River drainage in 1936. There now seems to be considerable evidence that diseased pine is present somewhere in the lower reaches of the Rogue.

With the rust now known to be a short distance from the California line - 50 miles on the coast, and 65 miles in the Cascade region - there is every reason to believe its presence in California will be discovered in 1936. A larger scouting force than existed in 1935 would seem to be warranted, in view of the present status of the rust in Oregon. Furthermore, a study of the behavior of the rust in southern Oregon by some agency could well be inaugurated, with the intent of ascertaining how the rust may act in northern California.

EDUCATIONAL WORK, CALIFORNIA, 1935

by

George A. Root
Associate Pathologist

Besides the usual educational program, presented at the various camps by members of the control project, work of an educational nature still continues with the public at large.

During the early part of 1935, a resume of the work for 1934 in the form of a mimeographed letter was sent to all County Agricultural Commissioners, Farm Advisers, and others interested in general forest conservation. Likewise, an article, "Blister Rust Control Activities, 1934," was prepared for an issue of the Monthly Bulletin of the California Department of Agriculture. On August 5, a radio talk on blister rust was broadcast over Station KFBK in Sacramento. This was prepared in Washington and released under Farm Flashes in cooperation with the U. S. Department of Agriculture.

Requests from students and other individuals for literature and specimens continue to come throughout the year. In addition, there are always calls from high schools and colleges for blister rust material. Such material was furnished the High School at Lodi and the Junior College at Long Beach, California. At the suggestion of Mr. Ernest Wright of the Division of Forest Pathology at Lincoln, Nebraska, pamphlets, bulletins, and specimens of blister rust were sent to the Department of Pathology of the University of Nebraska. Several photographs on blister rust were sent to a Professor of Botany at the College of the Pacific at Stockton, California, for possible use in a textbook on botany.

BLISTER RUST CONTROL WORK IN COLORADO AND WYOMING 1935

Blister rust control activities in the Central Rocky Mountain Region were continued as cooperative projects between the Bureau of Entomology and Plant Quarantine and the Department of Forestry of the Colorado Agricultural College in Colorado; and between the Bureau of Entomology and Plant Quarantine and the Botany Department of the University of Wyoming in Wyoming. The basic memorandums of understanding are given in the 1934 annual report.

BLISTER RUST CONTROL WORK IN COLORADO AND WYOMING, 1935

By
E. L. Joy
Associate Forester

INTRODUCTION

Before starting a white pine blister rust control program in a given region, the owners of forest lands or those responsible for the management of such lands within that region must have before them certain data on which they can base their decisions as to the feasibility and practicability of such a program. It is the obligation of the Division of Plant Disease Control, when so requested, to conduct such surveys and investigations as will yield this required information. In 1934 such a project was started in Wyoming and Colorado for the Central Rocky Mountain region. The work in that year consisted of a white pine-Ribes survey to ascertain the acreage of white pine in each state and the kinds and numbers of Ribes within the stands of white pine.

In 1935 the second phase of this preliminary investigation, the experimental Ribes eradication work was started in the two states in which the survey was conducted in 1934. The areas selected for this program are the Brooks Lake unit on the Washakie National Forest in Wyoming and the Middle Beaver Creek unit on the Pike National Forest in Colorado. These areas were selected, after conferences with regional and local forest officials, for the following reasons:

1. They support or are potentially capable of supporting valuable white pine.

2. They supported the principal species of Ribes in not less than the average abundance for white pine stands of one or more forests in the immediate vicinities.

3. They are representative of the topographical and altitudinal conditions encountered in stands of white pine on one or more forests in the immediate vicinities.

4. They are of special importance as recreational areas.

5. They are reasonably accessible.

PURPOSE OF EXPERIMENTAL RIBES ERADICATION

The purpose of the experimental Ribes eradication is to ascertain the cost of the local control of white pine blister rust in the Central Rocky Mountain region.

COOPERATION

As in 1934, the Forest Service, National Park Service, Colorado Agricultural College and the University of Wyoming cooperated with the Division of Plant Disease Control in this program. Both regional and local officers of the Forest Service gave generously of their time and facilities toward the planning and execution of the work. Through amendments of the original cooperative agreements, Colorado Agricultural College and the University of Wyoming extended their

participation in the work for the fiscal year 1936.

ORGANIZATION AND ADMINISTRATION

General supervision of the Central Rocky Mountain region work is handled by a leader and assistant leader. During the 1935 season two 44-man ERA camps, one each in Colorado and Wyoming, were operated. A camp boss and assistant directed each camp. However, due to the fact that it was necessary to train men inexperienced in Ribes eradication for the camp boss and assistant assignments, the regional leader and his assistant each engaged in active supervision of a camp. The regional leader acted in this capacity in the Wyoming camp while his assistant was responsible for the Colorado unit.

The full time personnel of the Division of Plant Disease Control for the Central Rocky Mountain region are E. L. Joy, in charge, and C. M. Chapman, assistant. Seasonal appointment personnel for supervision of the two camps were as follows:

Wyoming - T. L. Thompson, camp boss
F. T. Hirst, assistant

Colorado - C. F. Finn, camp boss
R. E. Reinhardt, assistant

Since only certified reliefers could be employed for the crew labor required, these were requisitioned through the National Reemployment Service offices in the counties in which the work was done. In Colorado a heavy relief load in El Paso county made it a relatively simple matter to secure the requisite number of workers for the camp operated in that county. The opposite was true in Wyoming since the number of available workers in the two counties in which the work was performed was inadequate to fill the needs of one camp. A request was made to the State Director of WPA for authority to secure the men from other than the designated counties. This request was referred to the Director of Transient Relief who arranged to supply the required number of men by the assignment of transient reliefers from the Casper transient camp. These men were transported by truck from Casper to the blister rust camp, a distance of 250 miles.

METHODS AND EQUIPMENT

From the pine-Ribes survey made in 1934 it was learned that the principal control problem in both Colorado and Wyoming is the eradication of Ribes from the uplands. Since no experimental work had been done on the use of chemicals to eradicate Ribes from areas in those states, hand pulling appeared to be the most practical known method and was therefore adopted. Due to the size and nature of the Ribes bushes trench picks were issued to facilitate hand pulling. This tool was used with fair success in Wyoming but was soon discarded in favor of 7-pound mattocks in Colorado. The latter proved very effective in grubbing Ribes roots and moving rock in the granitic rock and decomposed granite formations encountered.

The possibility of realizing more efficient and more effective upland Ribes destruction through the use of chemicals was suggested in 1934 during the course of the pine-Ribes survey. The factors which caused the interest in this

method as contrasted with straight hand pulling and grubbing are:

1. The rocky and rugged sites supporting Ribes, the extreme of which is the all too often occurrence of Ribes growing with roots deeply imbedded in the crevices of rock.

2. The deep rooting habit of the upland Ribes, a condition brought about by the dryness of the sites.

3. The layering and matting habit of Ribes montigenum, a common species of the white pine type.

Consequently, small scale tests of the effectiveness of various chemicals on upland Ribes, as outlined by H. R. Offord were started in both states. The detailed review of these experiments is included in the report of chemical investigations which appears elsewhere in this volume.

CHECKING

Since the Ribes eradication work of each camp was insufficient to justify the employment of a man whose sole duty was checking the efficiency of this work, this duty was performed by the supervisory personnel of each of the two camps operated. This consisted of a daily check-up behind crews, a random cruise check of the worked portions of nearly completed crew divisions and the final systematic strip cruise of these divisions when completed. By this method it was usually unnecessary to rework more than small portions of a division, if any, and this was usually done before the crew was assigned another division.

RESULTS AND COSTS

Table No. 1 gives a condensed summary of the Ribes eradication results and costs in each state. The cost per effective man day in each state is considerably higher than the $6.00 average which was determined from data secured over a period of years in the Inland Empire. Consequently the cost per acre is also higher than average for similar conditions. The main items that operate to make these costs higher than normal are the heavy technical supervision charges, which would normally be distributed over at least twenty camps instead of two, the necessity for carrying equipment charges of a normal four months' season during a two and one-half months' season and the small number of effective man days of work resulting from the short and late season, much of which included adverse weather conditions. Two other factors, which apply only to the Wyoming camp, are that it was impossible to keep the camp at full strength due to a shortage of available men and that the camp could be operated for only two months.

Allowing for these influences in so far as possible, the cost figures per effective man day and per acre have been revised. For this purpose, the total cost was reduced by using only ten percent of the technical supervisors' wages and the total number of effective man days was considered as the actual number plus those spent on forest improvement work and those that were lost, both of which occurred during adverse weather. On this basis, the results are as follows:

	Colorado	Wyoming	Both
Cost per effective man day	$5.72	$8.55	$6.67
Cost per acre	4.41	1.23	2.09

It is evident from the above that the full strength camp operated for three months in Colorado theoretically produced at a cost comparable to the Inland Empire average. Although the above Wyoming man day cost does not compare favorably with this average, additional allowance for the fact that the camp in this state was operated for only two months at less than full strength will bring the man day cost for Wyoming very close to the $6.00 yardstick.

INDIVIDUAL PROJECT REPORTS

Detailed reports of the work done in each state are presented under the following titles:

1. Experimental Ribes Eradication, Colorado.

2. Experimental Ribes Eradication, Wyoming.

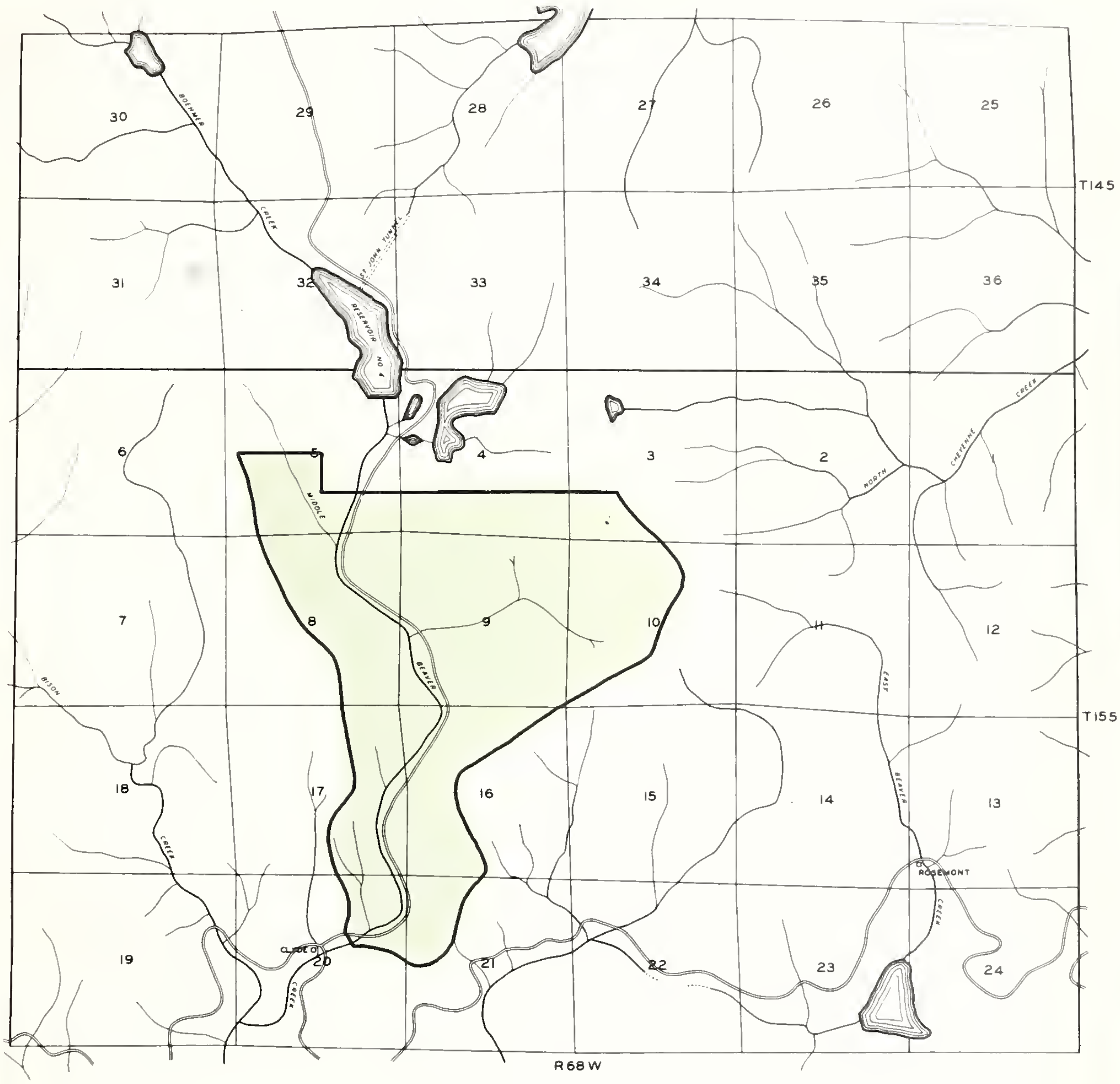
TABLE NO. 1

SUMMARY OF RIBES ERADICATION RESULTS AND COSTS
COLORADO AND WYOMING, 1935

State	Total Acres	Total Ribes	Total Man Days	Total Eff. Man Days	Total Net Cost	Eff. Man Days Per Acre	Ribes Per Acre	Cost Per Eff. Man Day	Cost Per Acre
Colorado	2,257	148,504	1,989.4	1,502.7	$12,732.32	0.67	58.2	$ 8.47	$ 5.64
Wyoming	6,126	85,429	1,251.3	705.9	9,523.41	0.11	13.9	13.49	1.55
Both states	8,383	233,933	3,240.7	2,208.6	$22,255.73	0.26	27.9	$ 10.08	$ 2.65

RIBES ERADICATION AREA

MIDDLE BEAVER CREEK UNIT
PIKE NATIONAL FOREST
COLORADO



LEGEND

ORIGINAL WORK

SCALE

1 ½ 0 1 MILE

ANNUAL REPORT 1935
C.M. CHAPMAN

M.L.N. 1/15/36

EXPERIMENTAL RIBES ERADICATION, COLORADO, 1935

by

C. [illegible]. Chapman

Agent

INTRODUCTION

On August 5, 1935 equipment and supplies for the first Ribes eradication work in Colorado were moved into the Middle Beaver Creek area on the Pike National Forest. Relief labor from El Paso County was used. Within one week the camp was operating at full strength and continued to operate this way until the end of the field season on October 26.

CAMP SUPPLY

Staple products for the camp were secured through the Forest Service Central Purchase unit in Denver and perishable products through competitive bidding by dealers in Colorado Springs. Since the distance from the camp to Denver is 120 miles and to Colorado Springs 30 miles, the government-owned camp truck was used to freight the supplies.

LOCATION AND DESCRIPTION OF AREA

The working unit is located on Middle Beaver Creek, Pike National Forest, adjacent to, and north of the Gorley Mountain highway 30 miles from Colorado Springs. The soil of this area is of comparatively recent origin and consequently very thin. Glacial drift in the form of large boulders is ever present and the topography in general is steep. The altitudinal range of this area is 9,500 feet to 12,000 feet, the latter being timber line.

METHODS AND EQUIPMENT

Most of the work was done by hand pulling and grubbing. The usual eradication crew consisted of three men, each man being equipped with a heavy duty mattock to facilitate the removal of Ribes roots from the rocky sites. String was used to divide the area into crew lanes, these varying in width according to the density of the Ribes and the visibility on either side of the worker. In general the lanes varied from one-half chain to one and one-half chains in width.

Checking of the eradication work was performed by the camp boss and his assistant. The strip-cruise method, by which data are secured from .2-chain-wide strips run through the worked areas at ten-chain intervals, was used. Areas were classed as satisfactory only when the checking results showed the remaining Ribes to total less than 25 feet of live stem per acre.

TIMBER COVER

The species of coniferous trees growing on the Middle Beaver Creek area, in order of their numerical importance, are bristlecone pine (*Pinus aristata*), Engelmann spruce, limber pine (*P. flexilis*) and alpine fir. Mingled with the conifers in openings in the stands or on open slopes is the quaking aspen. This tree constitutes a large part of the most evident ground cover on this area, as in

Bristlecone pine (P. aristata) invading grassland, Pike National Forest, Colorado.

Alpine prickly current (R. montigenum) growing among granite boulders and bristlecone pine (P. aristata) snags on area burned over in 1888.

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the entire Central Rocky Mountain region, but a careful check will usually reveal it to be the nurse crop for coniferous reproduction. All native species of conifers seem to benefit from the protection of aspen.

About one-half of the Middle Beaver Creek unit supports small quantities of natural reproduction or plantations of bristlecone pine and Engelmann spruce growing on an area burned over forty-seven years ago. The balance of the area is well stocked with natural reproduction and pole stands of the native conifers.

RIBES

Three species of Ribes were found on the working area. In the order of their numerical importance they are Ribes montigenum (88 percent), R. inerme (8 percent) and R. cereum (4 percent). R. montigenum, which occurs as matted and sprawling bushes growing under and around the rocks, presents the chief eradication problem. It is hoped that experiments in the eradication of this species with chemicals will provide an efficient and effective method to replace hand pulling and grubbing.

RESULTS

In Table No. 1 there is given the analysis of reliefer time according to the class of work performed. It will be noted that over 76 percent of the total time was spent on Ribes eradication and that 91 percent of the time pertained directly to the accomplishment of this work.

TABLE NO. 1

ANALYSIS OF RELIEFER TIME,
MIDDLE BEAVER CREEK, COLORADO, 1935

Class of Work	No. of Hours	No. of Man Days*	Percent
Hand eradication	12,020.0	1,502.7	75.54
Chemical eradication	123.5	15.4	.77
Forest Service work (contributed time)	825.5	103.2	5.19
Camp construction	321.5	40.2	2.02
Camp wood	339.0	42.2	2.12
Flunkeys	864.5	108.0	5.43
**Travel time	194.0	24.3	1.22
Lost time, weather	954.0	119.2	5.99
Labor Day, holiday	273.0	34.2	1.72
Total	15,915.0	1,989.4	100.00

*Eight hours constitute one man day
**Travel time credited reliefers from the point of hire to the camp and return to point of hire

Table No. 2 gives the summary of Ribes eradication by types. It is

shown that the open pole type supported about one-third more Ribes per acre than the old burn, which includes scattered reproduction and plantations. One explanation of this fact is that cattle grazing in most of the burned-over area has destroyed or inhibited the Ribes growth. Positive evidence of this is seen on one part of the area where a fence separates grazing land from the Colorado Springs watershed property. Most herbaceous and brushy plant life on the grazing-land side of the fence has been practically destroyed.

TABLE NO. 2

SUMMARY OF RIBES ERADICATION BY TYPES, MIDDLE BEAVER CREEK, COLORADO, 1935

Eradication Type	Acres in Control Area			Eff. Man Days	Number of Ribes Pulled				Per Acre Basis	
	Worked	Ribes Free	Total		R. mont.	R. iner.	R. cer.	Total Ribes	Eff. Man Days	Ribes
Open Pole	1,049		1,049	862	78,866	7,013	1,836	87,715	0.82	83.6
Old Burn	1,079		1,079	641	52,307	5,010	3,472	60,789	0.59	56.3
Barren		28	28							
Meadow		101	101							
All Types	2,128	129	2,257	1,503	131,173	12,023	5,308	148,504	0.67	58.2

CHECKING

Most of the worked area was checked during the season. All but the work done during extremely wet weather at the end of the season resulted in less than 25 feet of live stem per acre after eradication. A complete check of the worked area will be made in 1936 in order to ascertain the amount of resprouting.

COSTS

Table No. 3 shows the classified expenditures for the Colorado project.

TABLE NO. 3

CLASSIFIED EXPENDITURES, COLORADO

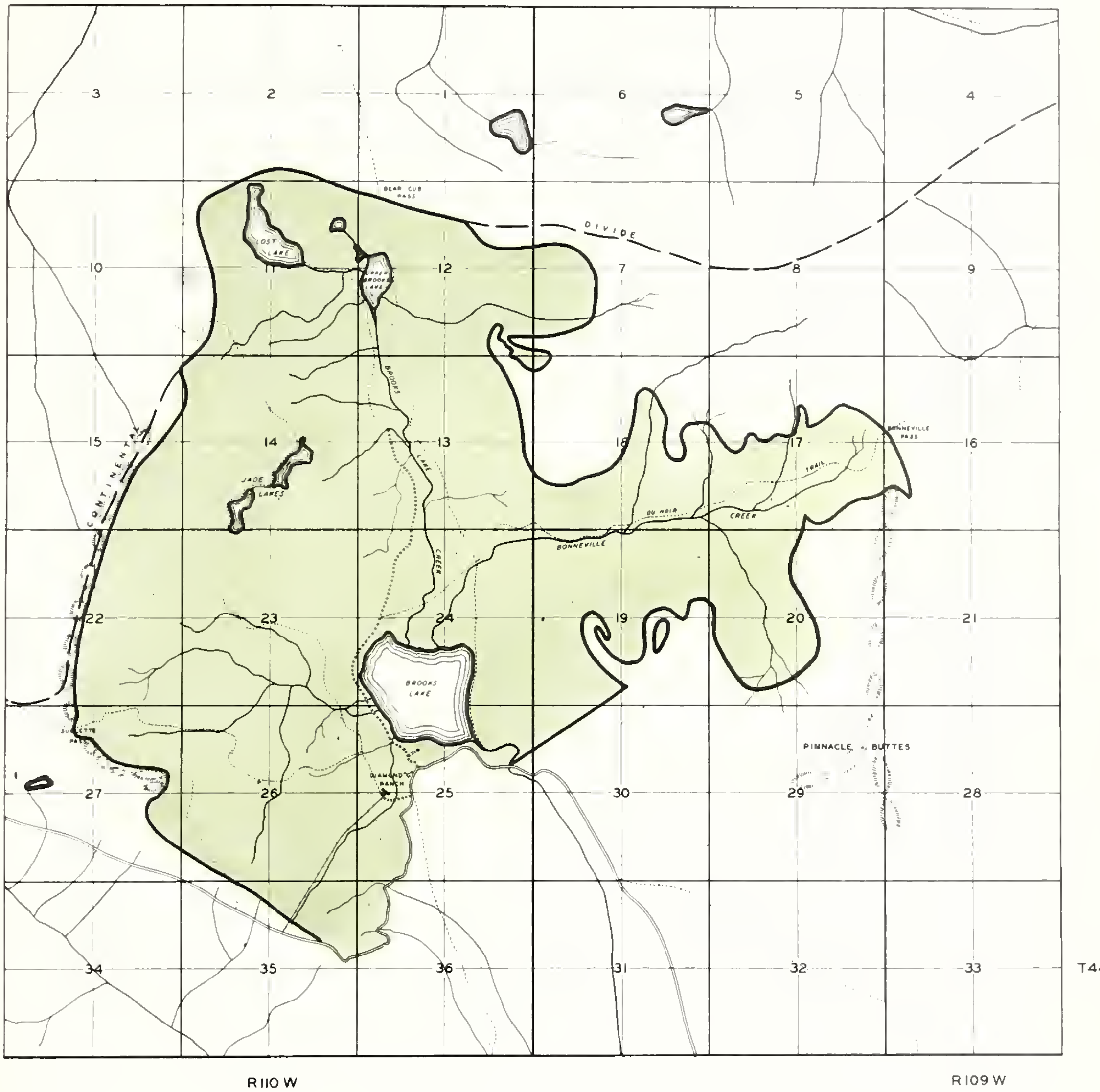
Class of Expenditures	Appropriation NIRA	Regular	ERA	Total Expenses
Salaries, perm. men	$1,293.28	$666.65	$ 1,119.41	$ 3,079.34
Salaries, temp. appt. men	114.91	200.20	797.56	1,112.67
Wages, temp. laborers			4,794.98	4,794.98
Subsistence supplies			2,028.93	2,028.93
Equipment	3.31		1,316.58	1,319.89
Travel and transportation	1.55	38.63	437.05	477.23
Twine	250.00			250.00
Other supplies and expense	57.75	.24	406.80	464.79
Total	$1,720.80	$905.72	$10,901.31	$13,527.83
Less unused supplies				233.13
Less unused twine				150.00
Less 2/3 new equipment				879.92
Plus 1/3 old trucks				449.25
Plus 1/3 1934 equipment				16.09
Net Cost				$12,730.12

Additional Cost Data:

Cost per effective man day	$8.47
Cost per acre	$5.64
Total cost of food	$1,795.80
Total number of meals served	8,705
Food cost per man day	$0.62

RIBES ERADICATION AREA

BROOKS LAKE UNIT
WASHAKIE NATIONAL FOREST
WYOMING



LEGEND

ORIGINAL WORK

SCALE

1 ½ 0 1 MILE

ANNUAL REPORT 1935
E. L. JOY

M.L.N. 1/15/36

EXPERIMENTAL RIBES ERADICATION, WYOMING, 1935

By
T. L. Joy
Associate Forester

INTRODUCTION

Camp equipment and supplies were on the ground at the previously selected Brooks Lake Camp site on August 20. Between August 20 and 26 only 10 reliefers could be secured from the counties in which the work was done. Therefore it was not until August 30, when 30 transient reliefers arrived from Casper, that the Wyoming operation was at full strength. This condition existed for less than three weeks, however, because of the impossibility of securing replacements for losses in personnel due to resignations and injuries.

CAMP SUPPLY

Due to the remoteness of much of the forested area of Wyoming, supplying camps becomes a definite problem. The Wyoming camp, although located on one of the two cross-Continental-Divide roads in the forests of the state, was 110 miles from the nearest railhead at Lander. This and the three other available railheads, ranging in distance from 110 to 250 miles from the camp, were compared as supply points. It was concluded that for the bulk of the staple supplies, it was most advantageous to ship from the Forest Service Central Purchase in Spokane to Gardiner, Montana from which point they were trucked 160 miles to the camp. The deciding point is that considerable advantage is obtained through the application of land grant railroad rates.

THE WORKING UNIT

The Brooks Lake area on the Washakie National Forest, selected for the experimental Ribes eradication work in 1935, is located in Township 44 North, Ranges 109 and 110 West of the Sixth Principal Meridian.

This area is bounded on the north and west by the Continental Divide, (boundary between the Washakie and Teton National Forests), on the south by the Lander-Jackson Hole road and on the east by the Pinnacle Buttes. The altitudinal range of the land varies from 9,000 to 11,500 feet but most of the timbered and Ribes-populated portion is below 11,000 feet. Portions of both the east and west boundaries of the area are marked by rugged, precipitous and timberless sandstone buttes.

Within this working unit there are numerous grassland meadows and several lakes. Another class of timberless area within the unit boundaries is the rocky talus-slope type at the bases of the sandstone cliffs.

TIMBER COVER

The timber cover of the Brooks Lake area includes, in the order named, white-bark pine (<u>Pinus albicaulis</u>) Engelmann spruce, lodgepole pine, Douglas fir and alpine fir. The largest part of this timber is mature ranging from 200 to 400 years old, these limits being based on ring counts of a few stumps on the area.

White-bark pine, the object of the protective work, varies in amounts on different parts of the area. It is found throughout the entire area but reaches its best in nearly pure stands on the upper slopes and ridges, especially on rocky,

White bark pine (P. albicaulis) and Engelmann spruce adjacent to Pinnacle Buttes, Washakie National Forest, Wyoming.

Dense mature white bark pine (P. albicaulis) near Togwotee Pass, Washakie National Forest, Wyoming.

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exposed sites. Spruce, through its adaptation to deep, moist soil, is the most abundant tree along the edges of meadows and on the lower slopes.

RIBES SPECIES

Five species of Ribes were found on the Brooks Lake area. In the order of their numerical abundance they are Ribes montigenum, R. lacustre, R. inerme, R. leptanthum, and R. viscosissimum. R. montigenum occurs chiefly on the rocky, exposed sites but is found also under dense timber cover growing in deep soil around tree bases. That this species is the chief eradication problem is indicated by two facts, namely, that the plants grow in a sprawling and matted form as the result of stem layering and that over three-fourths of the pulled bushes are of this species.

Of the four species that account for less than one-fourth of the bushes pulled, R. lacustre and R. inerme were found occasionally along streams or in other moist sites, R. leptanthum occurred only at the base of the cliffs on the east side of the area (west facing slope) and R. viscosissimum grew only on a small area that was burned over about 45 years ago but which now supports open reproduction four to six feet high.

It is of interest to note that of the eight species of Ribes associated with 5-needled pines in Wyoming, five were found on the Brooks Lake area. The other three, R. cereum, R. petiolare and R. setosum, were observed within only a few miles of this area. This gives rise to the estimate that control work on 25 000 acres in and around the Brooks Lake unit should provide data on the eradication of each of the eight species of Ribes associated with 5-needled pines in Wyoming.

CREW FORMATION

It was originally concluded that probably the most efficient Ribes eradication would be done by three-man crews. The short season and adverse weather conditions did not permit of much experimentation with crews of various sizes but some trials were given the two and three-man crews. Although accurate data wereno secured, it appears that the three-man crew is most satisfactory, but the four-man crew performs very well. The latter was especially efficient when the crew block contained the heavier concentrations of Ribes.

RESULTS

Due to the severe weather conditions encountered during the latter part of the season less than the usual percentage of the total number of man days was spent on Ribes eradication. However, 78.6 percent of all time was spent on Ribes eradication and the related camp work. The 21.4 percent balance includes Labor Day holiday time, travel time to and from point of hire, contributed time spent on Forest Service work which was possible when conditions were too severe for Ribes eradication and lost time on account of extremely severe weather. The following table gives the distribution of the total number of reliefer man days by work classes.

TABLE NO. 1

ANALYSIS OF [illegible] UNIT, WYOMING
1935

Work Class	Man Hours	Man Days*	Percent
Ribes eradication	5,647.1	705.9	56.4
Cook	77.0	9.6	0.8
Flunkey	923.5	115.4	9.2
Camp wood	661.4	82.7	6.6
Camp construction	560.5	70.0	5.6
Labor Day	260 0	32.5	2.6
Travel	476.0	59.5	4.8
Forest Service work**	442.0	120.4	9.6
Lost time	963.0	55.3	4.4
All classes	10,010.5	1,251.3	100.0

*Eight hours constitute one man day.
**During weather too inclement for Ribes eradication the men were assigned to recreational area improvement work near camp. At his request, a report of this time was submitted to Mr. Roy Williams, Supervisor of the Washakie National Forest.

About 95 percent of the 6,455-acre Brooks Lake unit is land area the balance being included in five lakes. Of the 95 percent in land area 45 percent supported Ribes and 50 percent was Ribes free or supported less than 25 feet of live stem per acre. It is evident, therefore, that the entire unit required intensive crew work on only about 45 percent of the area. Within the worked portion the Ribes occurred at rates up to 100 bushes per acre with an average of 39 bushes per acre.

The time involved in eradicating the bushes required up to 1.8 man days per acre. However, over the worked area the average was 0.24 man days per acre and over the entire land area in the unit it was only 0.11 man days per acre.

Table No. 2 gives a summary of the type and Ribes eradication data for the entire unit.

TABLE NO. 2

SUMMARY OF RIBES ERADICATION BY TYPES, BROOKS LAKE UNIT, WYOMING, 1935

Eradication Type	Acres in Control Area			Eff. Man Days	Number of Ribes Pulled						Per Acre	
	Worked	Ribes Free	Total		R. mont.	R. lac.	R. iner.	R. lept.	R. visc.	Total	Eff. Man Days.	Ribes
Dense Mature	2,715		2,715	705.9	66,284	14,537	2,625	1,319	664	85,429	0.24	39.1
Barren*	219		219									
Dense Mature		2,071	2,071									
Meadow		1,121	1,121									
Lakes		329	329									
All Types	2,934	3,521	6,455	705.9	66,284	14,537	2,625	1,319	664	85,429	0.11**	13.9**

*Fringe of rocky land above timber. Eradication data included with data from adjacent Dense Mature type.
**Based on land area only.

CHECKING

All of the area worked, excepting that completed at the end of the season, was systematically checked to determine eradication efficiency. On most of the area strips one chain wide were run through the stands, this width of strip being possible because of the scarcity of brush. Approximately six percent of the worked area was included in check strips. These showed that there was an average of 0.2 Ribes bushes with 1.4 feet of live stem per acre after eradication.

COSTS

Table No. 3 gives a summary of all expenditures for the Wyoming operation.

TABLE NO. 3

CLASSIFIED EXPENDITURES, WYOMING, 1935.

Class of Expenditures	Appropriation NIRA	Appropriation Regular	Appropriation ERA	Total Exp.
Salaries, Permanent men	$1,534.10	$666.65		$ 2,200.75
Salaries, Temporary men		55.55	$ 974.41	1,029.96
Wages, Temporary laborers			2,867.95	2,867.95
Subsistence Supplies			1,345.99	1,345.99
Equipment	2.08		1,273.19	1,275.27
Travel and Transportation	4.17		904.24	908.41
Chemical			1.13	1.13
Twine	550.00			550.00
Other Supplies and Expenses	48.12		340.78	388.90
Total	$2,138.47	$722.20	$7,707.69	$10,568.36
Less Unused Supplies				205.10
Less Unused Twine				450.00
Less 2/3 New Equipment				850.19
Plus 1/3 Old Trucks				449.25
Plus 1/3 1934 Equipment				11.08
Net Cost				$ 9,523.40

Additional Cost Data:

Cost per effective man day	$13.49
Cost per acre	1.55
Total cost of subsistence supplies	1,140.89
Number of meals served	6,829
Average food cost per day	$0.501

DEVELOPMENTS IN METHODS FOR THE CHEMICAL ERADICATION OF RIBES DURING 1935.

By

H. R. Offord, Pathologist, G. R. Van Atta, Assistant Pathologist,
R. P. d'Urbal, Assistant Chemist, and C. R. Quick, Assistant Pathologist.

INTRODUCTION

The work accomplished by the methods unit during the 1935 field season was sharply curtailed because of the transfer of personnel to Ribes eradication work under WPA appropriations. Van Atta and Quick were detailed to California eradication work early in August, and at that time, largely because of the shortage of regular funds during the month of July, had barely started the California and Oregon methods work for the 1935 season. In North Idaho, Offord and d'Urbal were able to devote the major portion of their time to the development of methods work. In this region field studies were continued in the testing of chemicals for the eradication of upland Ribes, chiefly R. viscosissimum, and a series of demonstrations was given to unit supervisors and camp bosses in all areas where difficulties were being experienced in the hand pulling work. This demonstration work proved to be very successful, and should be vigorously extended next field season.

This report describes the developments in chemical methods of Ribes eradication for the period September, 1934, to October, 1935, inclusive, and comprises data on the following topics:

A. Results of the 1934 field work.
B. Laboratory and greenhouse work September, 1934, to June, 1935.
C. Field work of 1935.
D. Recommendations for the use of chemicals in Ribes eradication.
E. Outline of office, greenhouse and laboratory work to be undertaken at Moscow and Berkeley during the winter of 1935-1936.

A. RESULTS OF 1934 FIELD WORK.

California

The 1934 R. roezli plots at Greens Flat, Plumas National Forest, and at Fiddlers Green, Stanislaus National Forest, were checked June 9-13, by Offord and Quick. At that time it was not possible to check the R. cereum plots at Gooseberry Camp, because of the heavy snow pack. These plots were examined August 1 by Van Atta and Quick. Summarized data on the R. roezli work are set forth in Table No. 1, and those for R. cereum in Table No. 2.

TABLE NO. 1

RESULTS OF 1934 DECAPITATION TESTS ON R. ROEZLI IN CALIFORNIA

Plot No.	Location	No. of Bushes Treated	Chemical Used	Ounces Chemical Per Crown	No. of Dead Bushes	Percent Bush Kill
1	Greens Flat Plumas N.F.	105	Borax	2	90	86
2		104	Borax + Water	2 2	93	89
3		102	Controls	None	57	56
4		50	Borax	1	39	78
4a	Fiddlers Green Stanislaus N.F.	116	Borax	2	104	90
4a		50	Controls	None	15	30

Results clearly show that borax is not sufficiently toxic to be used in regular eradication work, and cannot be employed as a substitute for the highly effective Diesel oil or ammonium thiocyanate. The failure of borax on R. roezli is in marked contrast with its effectiveness on R. viscosissimum, and can be partly explained by the dry soil conditions typical of R. roezli sites. This point is further exemplified by the variation in mortality among control bushes at Greens Flat and Fiddlers Green. The former area is quite dry, being located on the top of a long, gently sloping ridge; the Fiddlers Green plots are located in sugar-pine fir type, where soil moisture is comparatively high. Under these moist conditions a larger number of controls survived, but a somewhat greater kill was obtained on the chemically treated bushes. The addition of water in the treatment of the bushes for Plot 2, Greens Flat, resulted in 89 percent bush kill, while in Plot 1, where no water was used, bush kill was 86 percent. In North Idaho the addition of water had no effect on the toxicity of borax to R. viscosissimum. In this region the soil contains enough moisture so that an addition of one or two ounces at the time of treatment would not influence the toxicity of the applied chemical. Diesel oil is considered to be the cheapest and most effective chemical for use in connection with the decapitation of R. roezli. In areas where a relatively small number of bushes is to be treated, dry ammonium thiocyanate may be substituted.

In the experiments on R. cereum reported in Table No. 2, four intact and twenty-two decapitated bushes, or clumps, were treated by injecting into the soil measured dosages of chlorpicrin, chlorpicrin in mixture with kerosene, and straight kerosene. Treatment was made by means of a pal-injector type of tool known as the "Vermorel". Dosage of chlorpicrin varied from 1-1/3 ounces for the smallest bush to 17-1/3 ounces for the largest of the composite clumps. Chlorpicrin killed all but one bush. Kerosene was definitely less effective than chlorpicrin. Soil injection with chlorpicrin appears to be a highly effective treatment for R. cereum, but it is doubtful if the method is suitable for use by inexperienced workers.

TABLE NO. 2

RESULTS OF 1934 DECAPITATION TESTS ON R. CEREUM AT GOOSEBERRY CAMP, CALIFORNIA.

Bush or Clump No.	Notes on Treatment*	No. of Fluid ozs. of Chemical Applied	Result of Test, (Check Made 8/1/34)
1	Decapitated & treated with NaF in 1933. Retreated in 1934	Chlorpicrin 2	x
48	do	do 2-2/3	Alive
2a	Decapitated & treated 1934, 300 ft.L.S.	do 1-1/3	Dead
3a	do 2000 ft.L.S.	do 5-1/3	Dead
4a	1933 decapitation control, treated in 1934	do 4	Dead
5a	Decapitated & treated 1934, 600 ft.L.S.	do 4	x
7	Decapitated & treated with NaF in 1933 Retreated in 1934	do 2-2/3	x
42	1933 decapitation control, treated in 1934	do 5-1/3	Dead
6a	Decapitated & treated 1934,1000 ft.L.S.	do 6-2/3	Dead
40	Decapitated & treated in 1933 with NaF Retreated in 1934	do 5-1/3	Dead
7a	1933 control (no number on stake) Treated in 1934	do 1	Dead
8a	Decapitated & treated in 1934, 200 ft. L.S.	Chlorpicrin (1 part) + kerosene (1 part) 5-1/3	Dead
9a	do 3000 ft.L.S.	do 13-1/3	Dead
10a	do 400 ft.L.S.	do 6-2/3	Dead
11a	do 200 ft.L.S.	do 6-2/3	Dead
12a	do 400 ft.L.S.	do 6-2/3	Dead
13a	do 2500 ft.L.S.	do 17-1/3	x
14a	Intact bush treated 4000 ft.L.S.	do 16-2/3	Dead
15a	do 400 ft.L.S.	do 6-2/3	Dead
16a	do 400 ft.L.S.	do 6-2/3	x
17a	do 400 ft.L.S.	do 6-2/3	x
45	1933 decapitation control, treated in 1934	do 6-2/3	Dead
46	do	do 8	Dead
44	do	Kerosene 36	x
43	do	do 40	Alive
41	1933 decapitation control. Treated in 1934. Soil drench	do 45	Dead

*Except for bush #41, all treatments were made with a soil injector tool known as the Vermorel. This tool is of the pal-injector type. Chemical injected in a series of holes about crown at a depth of 8 inches.
x Bush stake missing when check was made in 1935.

Idaho

Lethal Dosage Tests on R. petiolare.

Dosage study plots on R. petiolare, located in the vicinity of Washington Creek, C.T.P.A., Idaho, were checked by Offord and d'Urbal during the period June 20 to 22. The plots were checked in the usual manner by marking off the 1/20 acre plot into 50 sub-plots by means of string lines, and recording the number of surviving root centers for each milacre. A summary of these data is given in Table No. 3.

TABLE NO. 3

RESULTS OF 1934 SPRAY TESTS ON R. PETIOLARE*

Plot No.	Gallons Solution** Per Acre	Lbs. Sodium Chlorate Per Acre	Lbs. Sodium Bicarbonate Per Acre	Number of Live Bushes Per Plot	Percent Bush Kill
1	1,200	600	600	0	100
2	1,200	600	-	0	100
3	1,000	500	500	1	99
4	1,000	500	-	2	97
6	800	400	400	3	95
7	800	400	-	2	96
5	500	250	250	2	96
8	500	250	-	7	90

*Each plot 66' x 33' = 1/20 acre.
**Molecular volume or bulking effect of chemical (1/2 lb. per gal. of water) not included.

The application of 250 pounds per acre of sodium chlorate, with and without the addition of sodium bicarbonate, resulted in a high percentage of kill; in fact, no data were obtained whereby the toxicity curve could be extended below 90 percent bush kill. Marginal bushes accounted for the largest percentage of the survivals. On plot 8, six out of the seven sprouts were marginal, and occurred on the top of a mossy log where the chemical solution had failed to penetrate; plot 6 had two marginally located survivors out of the three, while plots 3, 4, 5, and 7 each had one. Since practical crew work, because of its selective nature, involves a relatively large percentage of what might be called marginal bushes, the importance of this factor is at once apparent. Proper cognizance of this point has been taken in deciding upon the most economical dosage for operations work.

The addition of sodium bicarbonate in no way affects the toxicity of sodium chlorate. If anything, the chlorate-bicarbonate mixture is more effective than the straight chlorate, though this difference is probably not significant when the chlorate dosage is 400 pounds or more per acre. Should the price of Atlacide at any time be advanced appreciably over what it is at present, the chlorate-bicarbonate mixture could be effectively used in operations work. The current price of sodium bicarbonate is around 2 cents per pound as compared with 1 cent for calcium chloride; hence Atlacide is cheaper than a mixture of sodium

chlorate and sodium bicarbonate of equivalent chlorate strength.

Recheck of R. petiolare Clumps Treated by Eradication Crews.

During June and July of 1934 a study was made of the quantity of chemical applied by various crewmen during regular eradication work in the Schofield Creek area. In the course of these studies 218 clumps of R. petiolare were marked with a permanent stake, after data had been taken on the amount of chemical applied to the individual clumps. These plots were checked in June of 1935. Data showed clearly that the efficiency of spray work was directly related to the amount of chemical applied, and that a dosage of 1000 pounds of Atlacide per acre provided a practical clean-up job on R. petiolare. The data obtained from these studies were correlated with those furnished by the critical dosage tests (see Table No. 3 of this report), and on the basis of these combined data recommendations were made for the treatment of R. petiolare. See recommendations given in Section D of this report.

Decapitation Tests

During the period June 20 to June 26 Offord and d'Urbal checked the 1934 decapitation plots which were located on the Clearwater, Coeur d'Alene and St. Joe National Forests. Effectiveness of borax and ammonium thiocyanate are shown in the summarized data set forth in Table No. 4.

TABLE NO. 4

RESULTS OF 1934 DECAPITATION TESTS IN IDAHO

Plot No.	Ribes Species Treated	No. of Bushes Treated	Chemical Used	Ounces Chemical Per Crown	No. of Dead Bushes	Percent Bushes Killed
1 & 2	R. viscosissimum[a]	54	NH_4CNS	2	54	100
3 & 4	do	39	Controls	None	11	28
5	do	52	NH_4CNS	1	52	100
6	do	30	Borax	2	29	97
7	do	29	Borax + Water	2 2	26	90
1	R. viscosissimum[b]	33	Borax	2	33	100
2	do	25	Borax + Water	2 2	23	92
3	do	21	NH_4CNS	1	20	95
4	do	22	Controls	None	8	36
1	R. irriguum[c]	19	NH_4CNS	2	18	95
1	R. lacustre	12	NH_4CNS	2	12	100
2	R. irriguum	15	Borax	2	14	93
1 & 2	do	15	Controls	None	4	27
1 & 2	R. lacustre	2	Controls	None	1	50
3	R. irriguum	13	NH_4CNS	2	12	92
4	do	17	Borax	2	15	88
3 & 4	do	22	Controls	None	4	18

a. R. viscosissimum plots 1-7 located at Shanghai Ridge, Clearwater N. F.
b. R. viscosissimum plots 1-4 located near Santa, Idaho.
c. R. irriguum and R. lacustre plots 1-2 located on Little North Fork, and plots 3-4 located on North Fork, Coeur d'Alene National Forest.

On the basis of these data it is apparent that decapitation and chemical treatment of R. viscosissimum, R. lacustre and R. irriguum constitutes an effective eradication practice. Ammonium thiocyanate is more toxic than borax when used according to this procedure, and could be used in much smaller dosages. The latter chemical, however, is approximately five times as cheap as the thiocyanate, and

is much more readily handled under field conditions, being non-toxic and non-corrosive. If properly applied to bushes which have been decapitated through or below crown tissue, borax is 100 percent effective on R. viscosissimum.

It is interesting to note that decapitation alone, wihout the addition of chemical to the crowns, may result in as high as 50 percent bush kill. As might be expected, mortality of controls is higher in dry than in moist sites.

Oregon

Table No. 5 is a record of the results of the 1934 R. cereum plot experiments in the Rogue River National Forest, as they were disclosed by a check conducted during June 1935.

TABLE NO. 5

RESULTS OF 1934 EXPERIMENTS, UNION CREEK, OREGON.

Plot No.	Number Large Clumps Treated	Treatment	Average Chemical Per Clump	Percent Clumps Killed
1	140	Copper sulphate on decapitated crowns	0.36 pounds	0
2	600	Diesel oil on decapitated crowns	0.37 gals.	96
3	107	do	0.82 gals.	100
4	69	Crowns decapitated	None	0
5	512	Diesel oil on intact crowns	0.58 gals.	88
6	532	Diesel oil spray	0.26 gals.	8

Of the treatments reported, only those which involved the sprinkling of Diesel oil on intact and decapitated crowns warrant consideration as eradication methods. Studies made during and subsequent to the treatments, lead strongly to the belief that 100 percent destruction of large R. cereum clumps can be accomplished by sprinkling the decapitated crowns with an average dose of 1/3 gallon of Diesel oil per clump. This improvement in efficiency over that shown for plot No. 2 would require only that the oil be spread over a slightly larger ground area than is visibly occupied by the stumps of the cut stems. Improvement could also be achieved in the efficiency of crown drenches applied to intact clumps, but larger quantities of oil would be necessary, and the physical obstacles to perfect treatment make 100 percent clump kill doubtful in this instance. As matters now stand, the low labor requirement represented by the latter method suggests crown drenching without decapitation where rework can be contemplated. Where necessity for rework is a serious objection it is advisable to decapitate the clumps before applying the crown drenches. The problem involved in the digging of large R. cereum bushes, and the results that may be expected from one treatment, are illustrated in W1357, W1358 and W1664.

W1357 - Large R. cereum bush typical of those found in Rogue National Forest, Oregon.

W1358 - Showing the extensive digging needed to remove crown and roots of R. cereum.

W1664 - Large composite R. cereum crown one year after decapitation and treatment with Diesel oil.

B. LABORATORY AND GREENHOUSE WORK, SEPTEMBER 1934 TO JUNE 1935.

Greenhouse work of the winter 1934-35 adhered closely to the outline plan given in the 1934 Annual Report, and comprised investigations on topics immediately applicable to field work. This work was undertaken at Berkeley, California, and at Moscow, Idaho.

Fillers and diluents for ammonium thiocyanate were studied, with the object of finding a substance that would keep the thiocyanate in a sufficiently friable condition to permit packaging and handling in paper bags. Results of this work showed that in order to accomplish the objective, it would be necessary to add too large a volume of moisture-absorbing material, and that subsequent loss in hygroscopicity of the ammonium thiocyanate reduced the effectiveness of the chemical as a Ribicide. It was proposed as an alternative scheme that a cheap, light, waterproof container should be used. After investigation of possible materials and processes, a commercial treatment was selected. This process involved the treatment of Kraft paper bags with a zinc oxide and gum filler through the use of benzene as a volatile vehicle. The treatment produced a cheap and satisfactory container which was proved by subsequent field use to be fully practical for packaging ammonium thiocyanate.

A method was devised for the detection and estimation of small amounts of chlorate in soils. This work comprised the successful application of the thiocyanate test paper method to soils work. (H. R. Offord, Anal. Ed. Ind. & Eng. Chem. p. 93 Vol. 7 (1935).) The procedure has immediate application to field work for the testing of white pine and sugar pine type soils subsequent to the application of sodium chlorate. The work has been summarized in report, Serial No. 75, and has been recently approved by the Bureau for publication in "Northwest Science".

The Division of Plant Disease Control has frequently required information on the fixation and alteration of toxic chemicals applied to the soil in the course of the destruction of Ribes. These data were needed to aid in the prediction of lethal dose of chemical, and the determination of the length of time during which treated soils will remain sterile. This problem was studied last winter by periodic analysis of chemically treated soils, by germination of Ribes seed on soils containing known amounts of chemical, and by the use of rapid growing test plants such as oats and barley. A complete account of this work is available in Serial No. 72. Briefly, data from these experiments showed:

(1) That chlorate is less effective, i.e., more rapidly decomposed, in organic rich loam than in sandy soil.

(2) That applications of 5,000 pounds per acre of sodium chlorate or ammonium thiocyanate do not render the above soils sterile for more than one season.

(3) That a concentration of 640 p.p.m., approximately 700 pounds of sodium chlorate per acre-foot, on the basis of a bone dry soil, prevents germination of R. petiolare seedlings.

(4) That, on the basis of data for the decomposition of chlorate in sugar pine and white pine soils, an initial treatment of 5,000 pounds per acre for

3. LABORATORY AND GREENHOUSE WORK, NOVEMBER 1950 TO JUNE 1951.

Greenhouse work of the winter 1950-51 followed closely to the outline plan given in the 1950 annual report, and practical limitations [illegible] immediately applicable to field work. This work was [illegible], [illegible], and at Moscow, Idaho.

Fillers and diluents for [illegible] were studied, with the object of finding a substance that would keep the [illegible] in a sufficiently friable condition to permit [illegible] and handling [illegible]. [illegible] work showed that in order to [illegible] the [illegible] it would be necessary to add too large a volume of [illegible], and [illegible] of the [illegible] reduced the effectiveness of the chemical as a [illegible]. It was concluded that [illegible] light, waterproof container should be used. After investigation of possible materials and [illegible], a commercial treatment was selected. This [illegible] involved the treatment of [illegible] and the use of [illegible]. The treatment [illegible] satisfactory [illegible] for [illegible].

A method was [illegible] for the [illegible] of small amounts of chlorate in soils. This [illegible] thiocyanate test [illegible] Chem., [illegible] Vol. 7 (1935).) The procedure has [illegible] modification [illegible] for the testing of white pine and sugar pine [illegible] of sodium chlorate. The work has been [illegible], Serial No. [illegible], and has been recently [illegible] for publication in [illegible].

The Division of Plant Disease Control has frequently [illegible] information on the fixation and [illegible] of toxic chemicals applied to the soil in the course of the destruction of Ribes. These data were needed to aid in [illegible] of lethal dose of chemical, and the determination of the length of time for which treated soils will remain sterile. This problem was studied last winter by periodic analysis of chemically treated soils, by [illegible] of soils containing known amounts of chemical, and by the use of [illegible] plants such as oats and barley. A complete account of this work is [illegible] Serial No. 72. Briefly, data from these experiments showed:

(1) That chlorate is [illegible], i.e., more [illegible], in organic [illegible] than in sandy soil.

(2) That applications of 1,000 pounds per acre of [illegible] thiocyanate do not render the [illegible] soil sterile [illegible] season.

(3) That a concentration of [illegible] sodium chlorate per acre-foot, on the [illegible] soil, prevented [illegible] of R. *petiolare* seedlings.

(4) That, on the basis of [illegible] of chlorate in sugar pine and white pine soils, an initial treatment of 4,000 pounds per acre-

organic rich soils, and 3000 pounds per acre for sandy soils, would be needed to prevent germination of Ribes a year after application of the chemical.

In response to a request from the photographic unit of this office, a study was made of light filters which might be suitable for rendering strong monochromatic contrast between green, and brown or red foliage. The immediate objective was the proper photographic recording of blister rust damage to white pine. Data obtained in this study have furnished a practical scheme for the selection and use of a red filter that will provide excellent contrast. Details of this work are available in report Serial No. 73. This report has been approved by the Bureau for outside publication and has been submitted by Van Atta to the Journal of the Biological Photographic Association.

Preliminary work was undertaken on equipment for measuring the effect of solar radiation on the spontaneous ignition of chlorates in mixture with organic material. A detailed report on this work is available in Serial No. 70. Owing to the curtailment of methods activities during the 1935 field season, no opportunity was given to conduct the necessary field tests with this equipment.

Field experiments of 1933 and 1934 had shown that a mixture of sodium chlorate and sodium bicarbonate was as effective on R. petiolare as sodium chlorate. Laboratory and greenhouse tests were then undertaken to compare the stability of sodium chlorate, sodium chlorate plus sodium bicarbonate, and Atlacide, in Idaho stream-margin soils, in order to corroborate dosage figures obtained from field tests. These chemicals were added to the Idaho soil in amounts of 250 and 1000 p.p.m. in a series of tests at 10^{o} C. and in amounts of 250, 500, 1000 and 2000 p.p.m. at 16^{o} C. Subsequent analyses of the soils over a period of 3 to 5 months showed that there was no appreciable difference in the rate of decomposition of a mixture of sodium chlorate plus sodium bicarbonate, as compared with Atlacide or sodium chlorate alone. Details of this work are available in report Serial No. 77.

Greenhouse tests on potted R. inerme plants were undertaken to establish the comparative toxicity of sodium chlorate plus borax and sodium chlorate plus sodium bicarbonate. Each mixture was applied to five plants in amounts equivalent to dosages of 1.66, 3.33, 6.67, and 13.33 pounds of sodium chlorate per square rod. The corresponding amounts of bicarbonate and borax were two, three, and four times the amount of chlorate. The borax-chlorate mixtures were more toxic than the bicarbonate-chlorate mixtures, and the former mixtures in amounts of 6.67 and 13.33 pounds of chlorate per square rod gave complete kill of R. inerme plants. Increasing the amount of bicarbonate, however, resulted in a proportionately greater increase in kill than was obtained by a corresponding increase in the borax dosage. A complete report on this work is given in Serial No. 76.

Experiments in the germination of Ribes seed have been continued. The object of these experiments is to determine the factors responsible for the dormancy and germination of Ribes seed. The general method of approach to these problems has been to test the influence of various chemical reagents and environmental conditions on the germination of Ribes seed. Many of these tests carried through the summer months, and final data will be prepared in regular report form this winter.

organic rice soils, and 2000 pounds per acre for sandy soils, [illegible] without production of [illegible].

In response to a request from the [illegible] studies was made of [illegible] [illegible] between [illegible] [illegible] [illegible]. [illegible] of this work [illegible] by the [illegible] control of the [illegible].

Preliminary [illegible] of solar radiation on the [illegible]. A detailed report on this work [illegible] to the [illegible] was given to [illegible].

Field experiments in [illegible] chlorate and sodium [illegible] chlorate. [illegible] in field [illegible] field tests. These [illegible] 1000 p.p.m. [illegible] p.p.m. [illegible] 5000 p.p.m. [illegible] months shows that there [illegible] of a mixture of sodium chlorate [illegible] or sodium chlorate alone. [illegible] 7).

Greenhouse trials [illegible] the comparative toxicity of sodium chlorate [illegible] sodium bicarbonate. [illegible] of the [illegible]. The corresponding [illegible] times the amount of chlorate. [illegible] the bicarbonate–chlorate [illegible] pounds of chlorate [illegible] increasing the amount of bicarbonate [illegible] other damage [illegible].

Experiments on the germination of [illegible] object of these experiments [illegible] dormancy and germination of [illegible] seed. [illegible] has been to test the influence [illegible] conditions on the germination of [illegible] seed [illegible] through the summer months, and [illegible] this winter.

With the aid of six to ten SERA assistants, the Ribes garden in Strawberry Canyon has been greatly improved. About two and a half months were devoted to this activity last winter. The soil was spaded, weeded and heavily mulched, and many tons of small rocks were removed. Permanent paths were installed and the area was terraced. About 200 new plants were set out, and all plants were numbered and mapped. The garden now comprises some 50 Ribes species and a total of close to 500 plants. Data were taken on the time of flowering and fruiting for many of the Ribes species in the garden. Routine care was given to greenhouse material and a stock of plants was maintained for experimental purposes.

C. FIELD WORK OF 1935.

Idaho

Checking of the 1934 field plots was undertaken early in June. The following were inspected:

(a) Lethal dosage tests on R. petiolare.
(b) Decapitation work on R. viscosissimum, R. lacustre, and R. irriguum.
(c) R. petiolare bushes treated by regular spray crews in the Schofield area.

Data from this check work have already been summarized in the section of this report dealing with results of 1934 field work. On the basis of the R. petiolare plot work, more specific recommendations were given the operations men for the chemical eradication of this species. No additional plot work on R. petiolare was planned for the 1935 season. Instead, major attention was centered on establishing the scope and limitations of chemical methods for the eradication of upland Ribes.

Two objectives were named in the work plans on upland Ribes for the 1935 season. One comprised the testing and improving of chemicals, and the technic of treatment, by the establishment of small field plots; the other involved a demonstration of the use and effectiveness of powdered borax in decapitation work on R. viscosissimum. In the conduct of this latter work one or more days were spent in the Inland Empire camps where eradication of R. viscosissimum was being retarded because of heavy brush, buried crowns, rock or windfall. In a number of camps routine demonstrations were given in anticipation of future problems which might be encountered.

Decapitation Tests.

Plots were established on R. viscosissimum in the Kaniksu, Coeur d'Alene, St. Joe and Clearwater National Forests, in areas considered to be typical of the most difficult working conditions. These plots were designed to test the toxicity and establish the minimum lethal dosage of: ammonium thiocyanate; sodium chlorate plus borax (1:5), (1:3); Diesel oil; common salt; and ammonium thiocyanate plus common salt (1:7), (1:3), (1:1). In order to determine the effectiveness of late-season work, all of the above chemicals were tested in a series of plots established early in October. For each chemical, and for each dosage of most chemicals, two series of tests were made. In one group the Ribes were cut off through or below crown tissue; these tests are designated in Table Nos. 6A-6E as low cut and have been given the symbol L. In the other group the tops were cut off above

crown tissue, leaving one to two inches of stem; these tests have been described as high cut and are shown in Table Nos. 6A-6E by the symbol H.

Dry chemical was measured volumetrically in small containers which held the required dosage when measured full; Diesel oil and aqueous thiocyanate were poured from a small bottle calibrated in fluid ounces. Small amounts of aqueous thiocyanate were delivered from a syringe, or brushed over the crown, and the total amount of chemical used over the entire plot was subsequently determined; thus an average dosage figure was calculated for each crown. Special interest is attached to the use of small amounts of thiocyanate and oil, because of the possibility of extending chemical work on upland species. If two or three cc. of liquid are adequate for killing R. viscosissimum crowns, it would be possible for one man to carry sufficient chemical to treat all of the large bushes encountered by a three-man crew in the course of a full day's work.

The 1935 decapitation tests undertaken in North Idaho are shown in Table Nos. 6A-6E.

TABLE NO. 6A

1935 DECAPITATION TESTS ON R. VISCOSISSIMUM, ST. JOE NATIONAL FOREST, IDAHO
BOEHLS CABIN AREA

Plot No.	Chemical Used	Type of Cut[1]	Ounces Chemical Per Crown	No. Bushes Treated	Date of Treatment
1	Ammonium thiocyanate	L	1/4	59, 29 C	7/2
2	do	L	1/2	70, 15 C	7/3
3	do	L	3/4	66, 8 C	7/5
4	do	L	1	75, 4 C	7/5
5	do	H	1/2	53, 11 C	7/8
6	Diesel oil	L	2	50	7/9
7	do	L	1	49, 1 C	7/9
8	do	L	1/2	21	7/10
9	Ammonium thiocyanate	H	1	49, 1 C	7/10
	do	H	1-1/2	50	7/11
10	do	H	2	15	7/11
11	do	H	2	17, 2 C	7/11
12	do	H	2	19, 1 C	7/11
1a	Chlorate and borax (1:5)	L	1	60, 13 C	8/21
2a	do	L	1/2	51, 11 C	8/22
3a	do	L*	1	53, 6 C	8/22
4a	do	H	2	48, 12 C	8/23
	do (1:3)	H	1-1/3		
5a	do (1:3)	L	2/3	88, 24 C	8/23
6a	Ammonium thiocyanate 10%	L	1		
	do	H	1	64, 12 C	8/26
7a	do (Sat.)	L	2.3 cc	55, 1 C	8/28
8a	do (Sat.)	H	3.4 cc	44	8/29
11	do (Sat.)	L**	1	50	8/30
12	Chlorate and borax (1:5)	L**	1	37	8/30
13	do	L**	1	15	8/30

[1] L = Low cut; H = High cut.
* Crowns buried.
**No scarification.

TABLE NO. 6B

1935 DECAPITATION TESTS ON R. VISCOSISSIMUM, ST. JOE NATIONAL FOREST, IDAHO BEALES BUTTE AREA

Plot No.	Chemical Used	Type of Cut[1]	Ounces Chemical Per Crown	No. Bushes Treated	Date of Treatment
1	Diesel oil	L	1	49, 14 C	8/5
2	do	L	2	58, 16 C	8/6
3	do	H	2	44, 10 C	8/8
4	Ammonium thiocyanate	L	1/4	58, 9 C	8/9
5	do	L	1/2	50, 12 C	8/9
6&7	Chlorate and borax (1:5)	L	1	51, 10 C	8/12
8	do	L	2	50, 7 C	8/12

TABLE NO. 6C

1935 DECAPITATION TESTS ON R. VISCOSISSIMUM, KANIKSU NATIONAL FOREST, IDAHO

Plot No.	Chemical Used	Type of Cut[1]	Ounces Chemical Per Crown	No. of Bushes Treated	Date of Treatment
	Pack Rat Gorge				
1	Ammonium thiocyanate*(Sat.)	L	1.8 cc.	56, 2 C	7/18
	Soldier Creek Area				
1	Diesel oil	H	1	47, 3 C	7/19
2	do	L	1	47, 3 C	7/19
3	do	H	2	59, 1 C	7/24
4	Ammonium thiocyanate	L	1/4	57	7/26
5	do	L**	1/4	60	7/26
6	Ammonium thiocyanate*	L	2 cc.	49	7/28
7	Ammonium thiocyanate*	H	4 cc.	50	7/29
8	Chlorate and borax (1:5)	L	1	50	7/29
9 &10	do	L	2	50	7/31
11	do	H	2	49, 21 C	8/1

[1] L = Low cut; H = High cut.
* Brushed on crown.
**Chemical applied to ground about crown - no contact with crown.

TABLE NO. 6D

1935 DECAPITATION TESTS ON R. VISCOSISSIMUM, COEUR D'ALENE NATIONAL FOREST, IDAHO
CATHEDRAL RIDGE AREA

Plot No.	Chemical Used	Type of Cut[1]*	Ounces Chemical Per Crown	No. of Bushes Treated	Date of Treatment
1	Ammonium thiocyanate + Sodium chloride (1:3)	L	1	48, 2 C	9/28
1	do	L**	1	45, 5 C	9/30
2	do	H	2	68, 10 C	9/30
2	Sodium chloride	L	1	26	9/30
3	do	H	2	30, 1 C	10/1

* Approximately half of bushes in each plot received no scarification.
**Crowns buried.

TABLE NO. 6E

LATE SEASON DECAPITATION PLOTS ON R. VISCOSISSIMUM
SHANGHAI RIDGE AREA

Plot No.	Chemical Used	Type of Cut[1]*	Ounces Chemical Per Crown	No. of Bushes Treated	Date of Treatment
1	Sodium chlorate + borax (1:5)	L	1	49	10/4
2	Diesel oil	L	1	50, 2 C	10/4
3	Ammonium thiocyanate + Sodium chloride (1:1)	L	1	49	10/5
4	Ammonium thiocyanate	L	1/2	19, 1 C	10/5

* On plots 1, 2 and 3 about half total number of crowns on each plot were left unscarified.

BOEHLS CABIN AREA

1 LS	Diesel oil	H	2	50	10/7
2 LS	Sodium chlorate + borax (1:5)	H	2	51	10/7
3 LS	Ammonium thiocyanate	H	1	49	10/8
4 LS	Ammonium thiocyanate + Sodium chloride (1:7)	H	2	25	10/8

[1] L = Low cut; H = High cut.

Demonstration of Decapitation Work in Eradication Camps.

The first step in the demonstration work at an eradication camp comprised a brief talk and practical demonstration to the camp boss and assembled crew leaders. Whenever possible, this talk was given before the crews left camp, in order to permit all of the camp personnel to participate in the demonstration. Following this general discussion, further demonstration work was undertaken with the crews engaged in difficult eradication work. No changes were made in the normal work routine except to supply one or more men on each crew with a cartridge belt filled with the two-ounce packages of dry chemical. The methods men worked behind the crew, and demonstrated the method of decapitation and chemical treatment whenever the eradication men encountered individual Ribes which were difficult to pull. In this way they were instructed in the method of treatment, and in the all-important matter of selecting Ribes for the chemical work. An attempt was made to visit each crew, and cartridge belts, paper bags, a measuring scoop and pruning shears, or Pulaskis were supplied to each camp where chemical work appeared to be needed. Treatment technic and equipment used are shown in photographs W1587-88-89 and 90. The methods men prepared a supply of finely powdered sodium chlorate and borax for crew use. One part of sodium chlorate was added to five parts of powdered borax in preparing the chemical formula recommended for operations work.

<u>Demonstration of Eradication Work in Eradication Crews.</u>

The first step in the demonstration work at an eradication camp comprised a brief talk and practical demonstration to the foremen and crew leaders. Whenever possible, this talk was given before the crews left camp in order to permit all of the camp personnel to participate in the discussion. Following this general discussion, further demonstration work was conducted with the crews engaged in difficult eradication work. To [illegible] normal work routine enough to supply one or more men in each crew with a carrying belt filled with the two-ounce packages of dry chemical. The extension man walked behind the crew, and demonstrated the method of application and chemical treatment whenever the eradication men encountered individual Ribes which were difficult to pull. In this way they were instructed in the method of treatment, and in the all-important matter of selecting Ribes for the chemical work. An attempt was made to visit each crew, and cartridge belts, paper bags, [illegible] and pruning shears, or Ribicide were supplied to each camp where chemical work appeared to be needed. Treatment technic and equipment used are shown in photographs #1557-58-59 and 92. This method has [illegible] a supply of [illegible] sodium chlorate and borax for crew use. (One part of sodium chlorate [illegible] to five parts of powdered borax is [illegible] for [illegible] operations work.

#1587 - Method of decapitating R. viscosissimum. The cut is made about ground level.

#1588 - Paper package containing two ounces dry chemical. Cartridge belt used as a carrying unit.

#1589 - Applying dry chemical to the cut off crown.

#1590 - Special canteen syringe used for applying Diesel oil to Ribes crowns.

The following is a summary of the Inland Empire camps in which practical use was made of the decapitation technic for the eradication of R. viscosissimum:

Kaniksu National Forest
ECW Camp S 263, Coolin
ECW Camp F 111, Lightning Creek
ECW Camp F 101, Gypsy Meadow
ECW Camp F 1, Sullivan Lake

St. Joe National Forest
ECW Camp F 138, Elk River
Forest Service, BRC Camp 5, Elk Creek
Forest Service, BRC Camp 4, Beales Butte

Coeur d'Alene National Forest
ECW Camp F 138, Beaver Creek

Clearwater National Forest
Forest Service, BRC Camp 2, Orogrande Creek
Forest Service, BRC Camp 3, Larch Butte
Forest Service, BRC Camp 5, North Fork Mussellshell Creek
Forest Service, BRC Camp 6, North Fork Mussellshell Creek

Besides the above listed camps where field work was undertaken with the decapitation method, four Montana camps and six Oregon camps were visited, and instructed in the application of chemicals to upland Ribes.

The manner in which this contact work was undertaken did not result in the compilation of actual cost figures to show the value of the chemical method in upland work. The reaction of camp bosses, crew leaders and laborers, however, was almost universally favorable. On some jobs a few individuals showed a tendency to treat bushes which would not have been difficult to hand pull. To offset this tendency, crew men were instructed to treat only those bushes which could not be pulled or dug without cutting out a great deal of brush, or moving fallen timber; thus the crew was able to utilize the decapitation treatment with no risk of lowering its work output.

Chemical Mixtures for Firing Bulldozer Brush Piles.

Experiments were carried out in Squaw Valley, Kaniksu National Forest, during the period September 19-24, 1935, to determine the value of various chemical mixtures in the firing of bulldozer windrows. This work was undertaken at the suggestion of Frank Walters and those in charge of bulldozer operations, who were pessimistic concerning the adequate ignition of piles composed of turf, Ribes, peat and considerable mineral soil.

Before field tests were begun, a series of laboratory and control tests were made by d'Urbal and Offord to devise mixtures which would produce high temperatures and at the same time furnish additional oxygen. Tests were commenced with the best of these mixtures at the bulldozer camp in Squaw Valley, four days after permission to start burning had been given. Moran and his men at the bulldozer camp had, in this time, fired a great number of the piles with much better results than had been anticipated. Their success was due in large part to the lightness

of the rains. One day later the Forest Service revoked their permit to burn due to the recurrence of dangerous fire weather.

Under this condition tests of the chemicals had to be confined to unburned portions of the piles that had already been fired. Such places were fortunately numerous and extensive enough to serve quite well.

The tests showed that mixtures of sawdust, chlorate and nitrate, packaged in one or two pound bags, and fired by fuses, were capable of starting lasting fires when used in conjunction with charcoal and dry wood, peat or other fuel. A mixture of 28 pounds of 8-18 mesh tamarack sawdust, 28 pounds of sodium chlorate, and 48 pounds sodium nitrate, or a mixture of 17 pounds of sawdust, 27.5 pounds of sodium chlorate and 55.5 pounds of sodium nitrate gave good results. Equally good results were obtained with mixtures of sawdust, charcoal, chlorate and nitrate.

Mixtures containing sulphur burned readily but had the serious drawback of producing large quantities of sulphur dioxide, which were inevitably inhaled while building up the fire after the charge was ignited.

Charcoal and Diesel oil, or shavings and Diesel oil, make very satisfactory mixtures for igniting brush piles. Coarse lumps of charcoal ($\frac{1}{2}$ to $1\frac{1}{2}$ inches in diameter) when soaked in Diesel oil readily absorb their weight in oil. Shavings absorb up to two times their weight in oil. The cost of such mixtures is low, and they are relatively safe to prepare, handle, and apply. The oil flames for several minutes, and then leaves a brazier of burning charcoal. The injection of Diesel oil into the piles with the aid of an extension on a knapsack spray pump would greatly improve burning.

The use of oxygen did not seem to be very practical, due to the unwieldiness of the tank, though very hot fires were produced when the oxygen was used in conjunction with charcoal. The possibility of using an air compressor warrants further consideration.

A complete report on the laboratory and field work is given in Serial No. 78.

Oregon and California

For reasons outlined in the introduction to this report the new work undertaken in California and Oregon for 1935 was fragmentary, and was not carried to completion. The checking work that was done in Oregon and California has been summarized in Tables Nos. 1, 2 and 5. During the latter part of July, Quick made some preliminary root studies of R. cereum, and Van Atta performed some methods development work on R. cereum, R. roezli, and R. viscosissimum. Both assignments were undertaken in the Punch Bowl area, Stanislaus National Forest. In the chemical work, various methods of decapitation and grubbing were compared, and Diesel oil and ammonium thiocyanate were applied to decapitated bushes. An examination of the treated bushes will be made in the spring of 1936. No additional plot work was undertaken in Oregon during the field season of 1935.

Washington

Examination of Chemical Plots at Swauk Creek.

of the pile. One day later the Forest Service [illegible] to the recurrence of dangerous fire weather.

Under this condition tests of the chemical [illegible] burned portions of the piles that had already been fired. [illegible] made numerous and extensive enough to [illegible]

The tests showed that mixtures of sawdust, [illegible] and placed in one or two pound bags, and fired by [illegible] ing fires when used in conjunction with charcoal [illegible] A mixture of 25 pounds of 8-10 mesh [illegible] and 25 pounds sodium nitrate, or a mixture of 17 pounds of [illegible] sodium chlorate and 55.5 pounds of sodium [illegible] results were obtained with mixtures of [illegible]

Mixtures containing sulphur [illegible] of producing large quantities of [illegible] while building up the fire after the [illegible] ignited.

Charcoal and Diesel oil, or [illegible] tory mixtures for lighting brush piles. [illegible] in diameter) when soaked in Diesel oil [illegible] absorb up to two times their weight [illegible] than are relatively able to [illegible] minutes, and then [illegible] burning charcoal. [illegible] oil into the piles with the aid of an extension [illegible] greatly improve burning.

The use of oxygen [illegible] ness of the fuel, though [illegible] conjunction with charcoal. The [illegible] further consideration.

A complete report on the laboratory and field [illegible]

No. 75.

[illegible]

For reasons outlined in the introduction [illegible] undertaken in California and Oregon for 1939 [illegible] to completion. The [illegible] summarized in Tables Nos. 1, 2 and 3. [illegible] some preliminary root studies of *R.* [illegible] development work on *R. [illegible]*, *R. [illegible]* and *R. [illegible]* were undertaken in the [illegible] local work, various methods of [illegible] and [illegible] of the [illegible] will be made in the [illegible] work [illegible] in Oregon [illegible]

[illegible]

Examination of Chemical Plots [illegible]

The 1932 Swauk Creek methods plots in the Wenatchee National Forest, Washington, were examined early in September. Considerable interest is attached to the annual inspection of these plots, because of the ecologic changes that are occurring in this area. On the thiocyanate, chlorate, and arsenic plots the original coverage of Ribes and deep rooted perennial shrubs has been replaced by heavy growth of grass and assorted herbaceous vegetation. Ribes which were partially killed do not seem to be spreading vegetatively, and many of the partly killed bushes are still suppressed and dormant. One or more Ribes seedlings of 1935 germination were found on each of the chemical plots examined, but very few of the 1934 seedlings had survived over the winter and spring of 1935. In illustrations W1070-1 and 2 are shown some of the interesting ecologic changes that have occurred in the group of arsenic plots during a period of three years since the chemical work of 1932. By application of a chemical which kills 100 percent of the brush and Ribes it is possible to completely change the type of vegetation cover.

The 1952 Sweet Grass methods plots in the Yosemite National [illegible], Washington, were examined early in September. Considerable interest is attached to the annual inspection of these plots, [illegible] occurring in this area. On the thiocyanate, chlorate, and arsenic plots the original coverage of Ribes and dense [illegible] has been replaced by a heavy growth of grass and assorted herbaceous vegetation. Ribes which were only partly killed do not seem to be spreading vegetatively, and most of the [illegible] bushes are still suppressed and dormant. One or more Ribes seedlings of 1954 germination were found on each of the chemical plots examined, but none of the 1954 seedlings had survived over the winter and spring of 1955. In illustrations R1070-1 and 2 are shown some of the interesting ecological changes that have occurred in the group of arsenic plots during a period of three years since the chemical work of 1952. By application of a chemical which kills all of the brush and Ribes it is possible to completely change the [illegible] of vegetative cover.

W1070 - An area of R. inerme and brush before treatment with sodium arsenite. Picture taken 1932.

W1070-1 - The same area one year after treatment with a sub-surface drench of sodium arsenite.

W1070-2 - Three years after treatment.

Wyoming and Colorado

Field tests in the chemical eradication of R. montigenum in Wyoming, and of R. montigenum and R. cereum in Colorado, were undertaken for the first time in 1935. These two Ribes species constitute a major problem to eradication crews employing methods of hand pulling chiefly because of the rocky sites in which they frequently occur. R. cereum is troublesome not only because of interfering rock, but also on account of its enormous size. The experiments were outlined by the methods unit and were performed under the direct supervision of Joy and Chapman.

The Colorado plots were examined by Joy and Offord, October 12-15, and at that time additional field tests with a mixture of Diesel oil and crank case oil were planned. Two plots were established immediately on R. cereum, and instructions were left for similar tests on R. montigenum. This latter work was completed with regular crew labor under the supervision of Chapman, and will comprise an excellent record of the effectiveness of oil applied late in the season.

A record of the plot work in Wyoming and Colorado is set forth in Tables Nos. 7, 8 and 9. Nothing can be said at the present time in regard to the effectiveness of the various treatments.

TABLE NO. 7

1935 CHEMICAL TESTS IN WYOMING

Plot No.	Chemical Used	Rate of Application: Ounces per Bush	No. Bushes Treated	Method of Treatment	Date of Treatment
R. montigenum - Sublette Pass,[a] Washakie National Forest					
1	$NaClO_3$ + borax (1:5)	3.4 - 21.2	59	Dry chemical Bushes cut off	10/3
R. montigenum - Twogwotee Pass,[b] Teton National Forest					
1	Atlacide (1# per gal. water)	7.8 (783# per acre)	41	Spray & soil drench	10/14
2	Atlacide (1# per gal. water)	16.4 (1,930# per acre)	22	Spray & soil drench	10/14

a. T44N, R110W, S27.
b. T44N, R110W, S32.

TABLE NO. 8

1935 CHEMICAL TESTS ON R. CEREUM, PIKE NATIONAL FOREST[a], COLORADO.

Plot No.	Chemical Used	Rate of Application: Ounces per Bush	No. Bushes Treated	Method of Treatment	Date of Treatment
1	NH_4CNS (2.8# per gal. water)	32.6	11	Spray and soil drench. Bushes intact.	9/26
2	NH_4CNS	4.2	19	Dry chemical. Bushes cut off.	9/26
3[b]	$NaClO_3$ + borax (1:5)	14.1 - 28.2	50	Dry chemical. Bushes cut off.	9/26 10/3
4	Diesel oil (28°Be)	18.3	7	Spray and crown drench.	10/3
5	Diesel oil (28°Be)	12.8	10	Crown drench. Bushes cut off.	10/3
6	Crank Case oil	61.6	20	Crown drench. Bushes intact.	10/10
7	Crank Case oil	38.1	20	Crown drench. Bushes cut off.	10/10

a. Plots located adjacent to Corely Mt. Highway; 32 chains from mile post No. 31, one mile west of Clyde.

b. Crowns were sprinkled with water before chemical was applied.

TABLE NO. 9

1935 CHEMICAL TESTS ON R. MONTIGENUM, PIKE NATIONAL FOREST[a], COLORADO

Plot No.	Chemical Used	Rate of Application: Ounces per Bush	No. Bushes Treated	Method of Treatment	Date of Treatment
1	NH_4CNS (2.8# per gal. water)	5.5	26	Spray and soil drench. Bushes intact.	10/4
2	NH_4CNS	3.8	28	Dry chemical. Bushes cut off.	10/4
3[b]	$NaClO_3$ + borax (1:5)	5.3	40	Dry chemical. Bushes cut off.	10/4
4	Diesel oil (32°Be)	14.2	9	Crown drench. Bushes intact.	10/5
5	Diesel oil (32°Be)	12.8	10	Crown drench. Bushes cut off.	10/5
1[c]	Diesel oil (32°Be) + Crank Case oil (1:1)	60 - 131	27	Crown drench. Bushes cut off.	10/21
2[c]	Diesel oil (32°Be) + Crank Case oil (1:1)	8 - 144	180	Spray and soil drench. Bushes intact.	10/21-10/23

a. Plots 1-5 located 56 chains from U.S.F.S. steel gate on Middle Beaver Creek Road. Plots 1[c]-2[c] in Middle Beaver Creek area, T15S, R68W, NE¼, S7.

b. Crowns were sprinkled with water before chemical was applied.

c. Applied by WPA crews as a practical job. Knapsack sprayer used for all treatments except bushes Nos. 28-36, which were treated by applying oil from garden watering can.

D. RECOMMENDATIONS FOR THE USE OF CHEMICALS IN RIBES ERADICATION.

R. petiolare.

Rate of Application. Apply Atlacide, one pound per gallon of water, as a spray and soil drench at the rate of 960 pounds of chemical per acre of R. petiolare. Use one-half pint of the standard stock glue solution for each ten-gallon batch of spray solution. The dosage just stipulated represents an application of five gallons of spray (one full tank) to a patch of R. petiolare 25 square yards in area, or one-fifth of a gallon per square yard. One-fifth gallon is equivalent to 26 full pump strokes. A full pump stroke is one complete stroke of the plunger either in or out. The use of full strokes is not obligatory since shorter strokes may be more satisfactory for certain individuals. Operators should check the number of strokes which they customarily use to deliver one-fifth gallon as a guide for applying the proper amount of solution.

Method of Applying Spray. First spray the central crown of the bush, or the central portion of a clump, applying the spray vertically downward into the soil,

and horizontally (for clumps) across the basal portion of the stems. This treatment should moisten the ground area shaded by the bush or clump. Then work upward along the stems of individual bushes and radially toward the outer edges of clumps, wetting all stems and turning the nozzle upward to moisten the under surface of the leaves. Finish with a top application to leaves and stems. Stress importance of getting ground coverage for lateral roots as well as central crowns. In so far as is practical, break out beaver dams to drain off the water from areas in which R. petiolare plants are partially submerged. All spray work should be completed by the middle of August. If it is extended beyond this date particular care should be taken to drench the soil thoroughly.

R. viscosissimum, R. lacustre and R. irriguum. (Large individual bushes which cannot be eradicated by pulling or grubbing.) Decapitate at ground level with a Pulaski, or pruning shears, and apply two ounces of a sodium chlorate-borax mixture to the scarified crown. The mixture should contain one part of chlorate to five parts of borax.

R. cereum. Cut off large bushes or clumps close to ground level with a Pulaski, and drench crown and soil about the crown with Diesel oil. The dosage of oil should average one-third of a gallon per large bush or group of bushes.

R. roezli and R. nevadense. Decapitate large individual bushes as recommended for R. viscosissimum. Apply two fluid ounces of Diesel oil or two ounces of dry ammonium thiocyanate per crown.

R. inerme. For inaccessible areas, or those too small to be worked by a bulldozer, treat with a spray and soil drench of Atlacide, 1.4 pounds per gallon of water, applied at the rate of 2,240 pounds per acre. Retreat surviving bushes the following year at the dosage rate of 4,800 pounds per acre.

E. OUTLINE OF OFFICE, GREENHOUSE AND LABORATORY WORK TO BE UNDERTAKEN AT MOSCOW AND BERKELEY DURING THE WINTER OF 1935-1936.

Moscow.

1. Preparation of a summary report on the 1934-35 greenhouse and laboratory work.

2. Movement of Diesel oil through white pine soils of varying moisture content, and penetration of oil into Ribes crowns across intact and scarified surfaces.

3. Penetration and movement of ammonium thiocyanate into remote root parts after application to scarified and unscarified crowns.

4. Study of chemical mixtures suitable for supplying oxygen and raising the ignition of brush piles for wet-weather burning.

Berkeley.

1. Preparation of 1935 Annual Report, and a special summary report on the progress in chemical and mechanical methods of Ribes eradication for the period

and horizontally (for clumps) across the basal portion of the plants. The treatment should not wet the ground ... [illegible]. Work along the stems of individual brushes and radially towards the outer edge of clumps, wetting all stems and bark to the point of [illegible] of the leaves. Finish with a [illegible]. Stress importance of cutting [illegible]. In so far as is practical, break out heavier [illegible] in which R. [illegible] plants are [illegible]. [illegible] completed by the middle of August. [illegible] care should be taken to [illegible] the soil [illegible].

1. R. [illegible], R. laciniatus and R. [illegible]. [illegible] cannot be [illegible] by [illegible]. [illegible], or [illegible] and [illegible] of a [illegible] to the [illegible]. [illegible] of [illegible].

2. [illegible]. [illegible] with [illegible] and [illegible] about the [illegible]. The [illegible] of [illegible] should [illegible] one-third of [illegible].

3. [illegible] and R. [illegible]. [illegible] for R. [illegible]. [illegible] and [illegible] of the [illegible] ammonium thiocyanate [illegible].

4. [illegible]. For [illegible] areas, or [illegible], [illegible] with [illegible] of [illegible], [illegible] at the rate of [illegible] pounds per acre. [illegible] at the [illegible] rate of [illegible] pounds per acre.

I. [illegible] OF [illegible] AND [illegible] OF [illegible]

Needs.

1. [illegible] to a [illegible] as the [illegible] and [illegible] more years.

2. [illegible] of [illegible] oil [illegible] with [illegible] content, and [illegible] of all [illegible] more [illegible] surface.

3. [illegible] and [illegible] of [illegible] early after [illegible] of [illegible] chemicals.

4. Study of [illegible] for [illegible] and the ignition of brush piles [illegible].

Progress.

1. [illegible] of 1938 [illegible], the [illegible] the progress in chemical and mechanical methods of [illegible].

1928 to date.

2. Maintenance and improvement of the Ribes garden in Strawberry Canyon, Berkeley, with the aid of a crew of three to four WPA workers.

3. Preparation of a report on the germination of Ribes seed for the winter of 1934-35. Continuation of studies on the conditioning of Ribes seed for germination, with special reference to: (a) alternation of temperature above and below freezing, (b) the depth of planting and nature of medium, (c) the effect of chemical agents.

4. Comparative effect of various dosages of sodium chlorate, sodium chlorate with borax, and borax alone, on the germination and survival of R. viscosissimum. Extension of these studies to include the effect of ammonium thiocyanate and Diesel oil on R. cereum and R. roezli.

5. Continuation of studies on factors which influence the origin and rate of combustion of sodium chlorate and organic materials, with special reference to new mixtures of sodium chlorate with borax and with sodium bicarbonate.

Note: Topics are arranged in order of priority for the two stations. Topics 2 and 3, Moscow, and 4 and 5, Berkeley, relate to the improvement of chemical work on upland Ribes. Topic 4, Moscow, pertains to burning work following clearing operations by bulldozer, or by slashing and burning. Topic 3, Berkeley, refers to general studies in the field of Ribes ecology.

INFECTION STUDIES AT NEWMAN LAKE, WASHINGTON, 1935

By
C. R. Stillinger
Associate Pathologist

INTRODUCTION

The studies on the Newman Lake area were continued during the 1935 season in accordance with the procedure as outlined in previous annual reports. The following data are a summation of the information obtained as a result of the studies made during the summer of 1935.

A. Eradication of Ribes inerme

Since one purpose of the study is to determine the disease-spreading ability of Ribes lacustre only, each season since 1929 the plot has been systematically worked in order to remove all R. inerme from the plot area. The eradication work this year was done during May, before there had been any opportunity for the blister rust to become established upon Ribes. The following table gives a summary of all R. inerme which have been eradicated since the inception of the plot studies.

TABLE NO. 1

AMOUNTS OF R. INERME ERADICATED FROM THE NEWMAN LAKE PLOT 1929-1935

Year	Acres Worked	Number Times Area Worked: Eradication Crew	Number Times Area Worked: Plot Crew	Total Feet Live Stem Eradicated	Feet Live Stem Per Acre
1929	45.0	2	1	126,884	2,820
1930	45.0	1	1	1,012	22
1931	45.0	1	1	516	11
1932	47.6	1	1	373	8
1933	50.0	1	1	395	8
1934	50.0	1	1	133	3
1935	50.0	1	1	95.5	1.9
7-Yr. Total	50.0	8	7	129,408.5	2,588

The size of the R. inerme bushes which were eradicated may be judged by the following grouping of the bushes into live stem classes: 9 bushes under 1 foot; 13 under 2 feet; 2 under 3 feet; 3 under 4 feet; 6 under 5 feet; 1 under 15 feet of live stem. These Ribes were distributed in 15 separate chain squares, ten of which are grouped in one location. The other five chain squares are scattered in the east one-fourth of the plot.

B. Ribes lacustre data

Records have been kept of 581 R. lacustre bushes. Of this number 89 are

now dead leaving a total of 492 living R. lacustre bushes on the plot in 1935. This is an average of 9.8 bushes with 490 feet of live stem per acre. The plot is divided into 467 chain squares. The Ribes occur on 161 of these squares of which 30 squares are on the east one-half and 131 squares are on the west one-half of the plot. These Ribes-populated squares constitute 12.7 percent of the chain squares on the east half and 56.4 percent of the chain squares on the west half. The east half has seven percent of the total number of Ribes bushes while the west half has 93 percent of this total. General observations as well as the above data indicate that the plot represents two distinct ecological units.

C. Ribes lacustre infection data

One inspection of all of the R. lacustre bushes on the plot was made during the period August 6 to September 9; at which time a quantitative estimate of the infection on each infected bush was recorded. A comparison is made in the following table of the average percentage of bushes infected in similar months of inspection during the last five years.

TABLE NO. 2

PERCENTAGE OF R. LACUSTRE BUSHES CLASSIFIED BY SHADE FORM THAT WERE INFECTED ON COMPARABLE INSPECTION DATES 1931-1935

Year of Examination	Percentage of Bushes Infected											
	No Shade			Half Shade			Full Shade			All Forms		
	June	July Aug.	Aug. Sept.	June	July Aug.	Aug. Sept.	June	July Aug.	Aug. Sept.	June	July Aug.	Aug. Sept.
1931	14.3	20.4	20.4	24.5	32.4	36.1	16.4	24.2	27.4	20.7	28.4	31.6
1932	13.9		25.7	[illegible]2.4		41.7	16.[illegible]		34.8	19.2		37.6
1933	0.0	26.2	28.6	0.7	26.1	28.4	2.2	29.7	31.3	1.4	28.0	30.0
1934	70.0	23.3	75.0	72.0	65.5	59.3	57.1	69.4	46.0	64.7	65.5	52.9
1935	* 60.0	*** 22.6	** 7.7	* 75.0	*** 28.2	** 32.0	* 71.2	*** 33.6	** 35.1	* 70.0	*** 31.7	** 34.1

*Data based on 20 special study bushes. All general Ribes inspected in August and September.
**September inspection.
***August inspection.

This table shows a heavy infection in June comparable to that in 1934 and in contrast to that of years previous to 1934. The July-August and August-September periods show definitely the marked decrease of infection on the Ribes growing in the open in contrast to those Ribes partially or fully shaded. The half shade and full shade forms, in contrast with the open form, show a development of over four times as much infection.

D. Special Ribes studies

This study consisted in the inspection at regular intervals of twenty selected R. lacustre bushes. The purpose of the study was to record the progress of the development of the disease on these bushes during the season. Data were taken on the size of the bush, the number of feet of live stem, the total number of leaves, the number of infected leaves and the percent of leaf area that supported each of uredinia, telia and necrotic tissue. Table No. 3 gives a summary of this study for the season.

TABLE NO. 3

DETAILED STUDY OF INFECTION ON 20 SELECTED R. LACUSTRE BUSHES
NEWMAN LAKE - 1935

Shade Class	Inspection Date	Total No. Infected Leaves	Percent Inf. per Inf. Leaf	Equivalent Number Leaves 100 Percent Infected			
				Uredinia	Telia	Necrotic	Total
No Shade (5 bushes)	June 20	5	1	0.1	0.0	0.0	0.1
	July 11	48	2.4	0.6	0.6	0.1	1.2
	Aug. 1	92	1.9	0.3	0.7	0.7	1.8
	Aug. 13	173	2.4	0.6	2.0	1.6	4.1
	Aug. 26	183	3.5	1.0	3.9	1.6	6.4
	Sept. 9	204	3.1	0.1	4.6	1.8	6.4
	Sept. 23	203	5.1	0.0	5.8	5.1	10.9
	Oct. 3	108	6.9	0.0	1.6	5.9	7.5
Half Shade (8 bushes)	June 20	45	1.3	0.6	0.0	0.0	0.6
	July 11	417	2.3	7.3	1.5	0.7	9.4
	Aug. 1	804	3.0	3.4	9.5	11.4	24.2
	Aug. 13	954	4.1	7.1	25.3	6.6	39.0
	Aug. 26	1,241	7.9	9.7	47.7	40.5	97.9
	Sept. 9	1,089	5.5	1.2	28.0	30.4	59.5
	Sept. 23	887	7.8	0.0	23.6	45.4	69.0
	Oct. 3	427	11.0	0.0	5.7	41.3	47.0
Full Shade (7 bushes)	June 20	275	3.7	9.3	1.0	0.0	10.3
	July 11	383	3.2	2.7	9.5	0.1	12.3
	Aug. 1	684	4.7	1.8	21.7	8.4	31.9
	Aug. 13	898	7.0	8.5	37.2	17.0	62.7
	Aug. 26	1,160	13.8	12.8	71.4	76.8	161.0
	Sept. 9	823	16.7	0.0	62.7	73.4	136.1
	Sept. 23	569	21.9	0.0	38.9	85.9	124.8
	Oct. 3	320	16.9	0.0	3.6	50.5	54.1
All Bushes	June 20	325	3.4	9.9	1.0	0.0	10.9
	July 11	848	2.7	10.6	11.5	0.8	22.9
	Aug. 1	1,580	3.7	5.4	32.0	20.5	57.8
	Aug. 13	2,025	4.3	16.3	64.4	25.2	105.9
	Aug. 26	2,584	8.9	23.4	122.9	118.9	265.3
	Sept. 9	2,116	8.5	1.2	95.3	105.6	202.0
	Sept. 23	1,659	12.6	0.0	68.3	136.4	204.7
	Oct. 3	855	12.3	0.0	10.9	97.7	108.6

The data in this table indicate the following facts based on the percent of infection per leaf.

1. The initial percentage of infection on each of the three shade forms, which is indicated by data from the first inspection in June, was in the ratio of 1:1.3:1.7.

2. This same relation on August 26--the last inspection before the leaves began to fall--was in the proportion of 1:2:4. This indicates that the more Ribes are shaded the greater will be the intensification of the disease during the usual season.

3. The greatest volume of infected leaf area existed on about August 26. The ratio of this leaf area for the open, half shade and full shade classes was 1:16:27.

4. The relative volume of telia developed by August 26 on Ribes of the different shade forms was in the proportion of 1:12:18. This ratio indicates the slower development of telia, the greater the shade or else a greater amount of tissue becoming necrotic without developing telia. This latter is indicated as part of the explanation at least since the ratio of necrotic tissue on this same date is 1:25:48.

E. Amount of telia produced on the plot

The total number of infected bushes on the plot during the season of 1935 was 190. Applying the results of the intensive study of the rust development on the selected bushes to the total number of infected bushes on the plot, the total telia-producing leaf surface or pine-infection potential on the plot was computed. These results with comparable data secured in previous years are given in table No. 4.

TABLE NO. 4

COMPARISON OF AMOUNTS OF TELIA PRODUCED EACH YEAR FROM 1929 TO 1935, NEWMAN LAKE, WASHINGTON

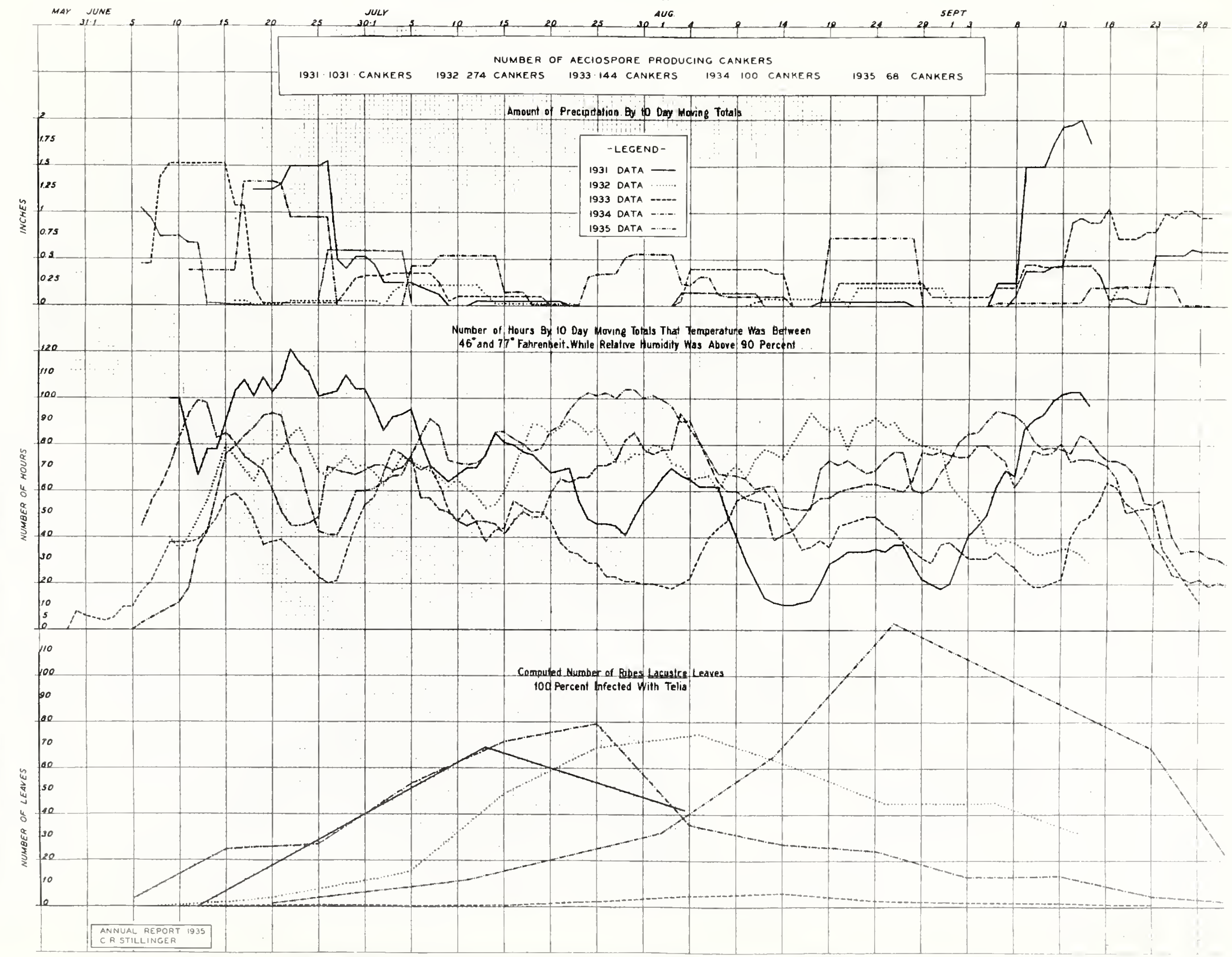
Period Examined	Computed Number of Leaves 100 Percent Infected with Telia	Percent of Total Infection Which is Telia
June-August, 1929	0.02	2.5
June-August, 1930	32.33	62.3
June, 1931	28.03	34.5
July, 1931	545.48	62.7
August, 1931	481.04	61.1
June, 1932	3.61	2.6
August, 1932	2,951.15	58.5
June, 1933	0.00	0.0
July-August, 1933	1,380.41	57.6
Sept., 1933	1,669.24	38.3
June, 1934	420.05	30.8
July, 1934	1,229.15	52.6
August, 1934	375.10	30.0
Sept.-Oct., 1934	72.85	15.3
June, 1935	14.0	9.4
July, 1935	128.4	50.2
August, 1935	508.7	58.8
Sept., 1935	497.9	40.2

Table No. 4 shows that the maximum of telia production occurred in July, 1931, August 1932, September 1933, July 1934, and August 1935. The percentage of the total infection which is telia reached its maximum each year, except 1933, in the same month that the greatest leaf area of telial production occurred.

F. Weather data

In an attempt to determine the correlation of weather factors with the production of telia, data were compiled from the daily weather records secured on the plot during the past five years, and from the infection records for a few selected bushes that were examined at frequent intervals during each of these years. Precipitation because of its known influence, was computed for each summer season by 10-day moving totals. In like manner, the number of hours of relative humidity above 90 percent during which hours the temperature ranged from 46 to 77 degrees Fahrenheit, were computed. These results, with data on the aecia and telia production for these years are presented in the following graphs.

RELATIONSHIP OF AECIOSPORE PRODUCTION AND WEATHER FACTORS TO TELIA PRODUCTION
ON RIBES LACUSTRE LEAVES-NEWMAN LAKE, WN
1931——1935



Comparing the temperature-humidity factor for the 1935 season with the same from the four previous seasons, the early season of June to the middle of July was about average, the last part of July was more favorable than usual, August was average, and September was favorable. With reference to precipitation the June period was average, July and August were above average, while September was very much below average. The telial production graph indicates a greater telia production this season than usual, but their development was somewhat slower, reaching the highest peak during August. This was about one month later than usual. This late yet more abundant development of telia is possibly due to the stimulation of uredinial development by moisture in early August and the successive rapid formation of telia due to relatively dry weather.

G. Pine infection data

A comparison of the pine infection data secured in 1935 with comparable data from inspections in previous years is given in Table No. 5. Table No. 6 gives the analysis of all cankers found in 1935.

TABLE NO. 5

PINE INFECTION DATA, NEWMAN LAKE, WASHINGTON
1929 - 1935

Item	1929	1930	1931	1932	1933	1934	1935
Number of acres in plot	25.4	36.2	36.3	47.6	50.0	50.0	50.0
*Total Number Pines Studied	752.0	1,334.0	1,338.0	1,576.0	1,580.0	1,580.0	1,580.0
*Total Number Pines Infected	65.0	111.0	126.0	173.0	185.0	200.0	215.0
Percent Pines Infected	8.6	8.2	9.4	11.0	11.7	12.7	13.6
Number Pines Killed by Blister Rust	0.0	1.0	5.0	9.0	12.0	16.0	17.0
**Total Number of Cankers	565.0	1,591.0	1,935.0	2,156.0	2,217.0	2,267.0	2,319.0
Number Cankers per Infected Pine	8.7	14.3	15.4	12.5	12.0	11.3	10.8

* Tagged trees, both living and dead.
** 21 cankers cut out in 1928 are not included.

TABLE NO. 6

ANALYSIS OF CANKERS, NEWMAN LAKE STUDY PLOT, 1935*

Year of Growth In-fected	First Sym.	Juv.	First Pyc.	Pyc. Scar	Produced Aecia Once	Twice	Sev.	Fruit. Bet.	Dead	Not Exam.	Total	Not B.R.	Grand Total
1932	3	5	8								16		16
1931		8	7	2				1	4		22		22
1930		4	2	1					5		12		12
1929	2			3		1			5		11		11
1928		1		11	3	2	1	5	34	1	58	1	59
1927				8	3	2	8	35	332	28	416	1	417
1926		1		6	1	6	25	105	898	72	1,114	16	1,130
1925			1	2		2	3	31	417	32	488	3	491
1924							2	7	107	5	121	1	122
1923				1			1	5	17	2	26		26
1922				1			1	2	13	3	20		20
1921									7	2	9		9
1920									1		1		1
1919								1			1		1
1918									1		1		1
?						1			2		3		3
Total	5	19	18	35	7	14	41	192	1,843	145	2,319	22	2,341

* 21 cankers cut out in 1928 are not included.

SUMMARY

1. In 1935, seven years after the initial eradication of R. inerme reworking of the Newman Lake plot resulted in the removal of 1.9 feet of R. inerme live stem per acre.

2. The amount of R. inerme found on the plot as well as the very limited distribution is such as to have a very minor influence, if any, on the results of the study work.

3. There are now 492 R. lacustre alive on the plot. Ninety-three percent of the Ribes are fairly evenly distributed over the west half of the plot. The other seven percent are distributed over the east half of the plot.

4. The number of bushes which were found to be infected was 38.6 percent of the total.

5. The information from the special study bushes indicated that the peak of telia production was reached about August 26.

5a. There appears to be a definite correlation between the distribution of precipitation and the development of telia.

6. The shade class of the bush has a very marked influence on the development of the disease on R. lacustre.

7. In 1935, 15 additional infected trees and 51 additional young cankers were found. This is an increase of 7.5 percent in the number of infected trees and of one percent in total trees on the plot.

RESULTS OF PINE DISEASE SURVEY AND SCOUTING IN THE INLAND EMPIRE, 1935

By
R. L. MacLeod
Associate Pathologist

In the fall of 1935 a pine disease survey was initiated in order to secure a sample of average conditions of pine infection in the white pine type of the Inland Empire. At the same time a special strip survey was carried on near Clarkia, Idaho in order to determine the extent and intensity of pine infection. Scouting for the disease on both pine and Ribes was done throughout the field season by the supervisory force on each control operation only in connection with their regular work. These three subjects are treated in this report under separate headings.

A. Pine Disease Survey.

This survey consisted in establishing temporary strip plots one rod wide and one-half mile long at the intersection of section lines with designated roads running in a generally north and south direction across each of five of the control operations. Strips were run along each section line for one-half mile on each side of the road in an east and west direction.

Seventeen regular appointees and thirty-four ERA men, assigned to this work, reported at Clarkia, Idaho on October 20 for a short, intensive course of instruction in recognizing and recording cankers. The regular strip survey started on October 24 and was completed on all operations by November 14.

On this survey trees from three to fifteen feet in height were examined and data were recorded by 5-chain transects. Three-man crews comprising one regular appointee and two ERA men were used, the regular appointee assuming responsibility for locating section lines, running the compass line and pacing. All three men inspected trees until infection was found when one of the ERA men acted as recorder tallying the number of infected trees and the length and diameter of cankers. From these length and diameter measurements it is possible to determine the approximate age of the cankers on the basis of data from previous studies of the growth rate of cankers. In this way it has been possible to ascertain with a fair degree of accuracy the relative amounts of pine infection that appeared in the years prior to 1931 and in each year from 1931 to 1934.

RESULTS OF WORK

On the Clearwater operation 30 half-mile strips were run from the road through Pierce and Headquarters, Idaho and 6 strips in the Mud Creek area south of Musselshell Ranger Station. Infection was found on 9 strips and on 31 trees, or 1.85 percent of the 1,677 pines examined.

On the St. Joe operation 127 strips were run and infection found on 52. The work was completed on the road from Dent through Elk River, Bovill, Clarkia to Santa, thence north to St. Joe City; from Santa to St. Maries; for seven miles south of Emida along the north and south highway and on four section lines in the northern part of the forest on the Wallace-Avery road. Of the 8,350 pines examined, 345 or 4.13 percent were infected.

On the Coeur d'Alene operation 39 strips were run from the road from the St. Joe National Forest boundary north through Wallace and Prichard, thence to Rock City and East Fork Administrative Sites. Infection was located on four of the 39 strips and 37 pines, or .65 percent of the 5,658 trees examined were infected. Owing to the preponderance of mature, pole and brush types along this road, additional strips and inspection points on side roads were designated for working. As this work was performed at more favorable locations for the rust than the regular survey which was designed to ascertain average conditions of infection, the results have been tabulated separately and are not included in the total data for the Inland Empire. As contrasted with the .65 percent infection found on the average sample survey infection was found at five of the favorably located inspection points on 166 pines or 4.32 percent of the 3,847 trees examined.

On the Kaniksu operation 77 strips were run from the West Branch road from Priest River north to beyond Nordman and along four section lines on the East Branch road south from Coolin. No infection was located on this operation.

On the Montana operation on the Kootenai and Cabinet National Forests 108 strips were run from the road extending from Noxon through Troy to Meadow Creek north of Sylvanite Ranger Station. In addition six miles of strip were run along the trail on the west side of Bull Lake. Infection was found on two strips and on four trees, .07 percent of the 5,980 pines examined.

The complete results of the survey are shown in the following table:

On the Coeur d'Alene operation 69 strips were run from the main fork [illegible] the St. Joe National Forest boundary north [illegible] to [illegible] and East Fork Administrative sites. Infection was located on [illegible] of the 69 strips and 87 pines, or .69 percent of the [illegible] trees examined were infected. Owing to the preponderance of [illegible], [illegible] along the road, additional strips and inspection points on the road were designated [illegible] forward. As this work was performed at more favorable locations for the [illegible] the regular survey which was designed to ascertain average conditions of infection, the results have been tabulated separately and are not included in the total [illegible] for the Inland Empire. As contrasted with the [illegible] infection found on the average sample survey infection was found at [illegible] of the favorably located inspection points on 165 pines or [illegible] percent of the [illegible] trees examined.

On the Kaniksu operation 77 strips were run from the east [illegible] from Priest River north to beyond [illegible] and along [illegible] section lines on the [illegible] Branch road south from [illegible]. No infection was located on this operation.

On the Kootenai operation on the Kootenai and Cabinet National Forests 103 strips were run from the road extending from [illegible] through [illegible] to [illegible] Creek north of [illegible] Ranger Station. In addition [illegible] along the trail on the west side of [illegible] Lake. Infection was found on [illegible] and on four trees, .07 percent of the [illegible] pines examined.

The complete results of the survey are shown in the following table:

TABLE NO. 1

PINE DISEASE SURVEY, INLAND EMPIRE, 1935.

SUMMARY BY OPERATIONS

Operation	White Pines				Canker Data										
		Infected						Time in Bark							
								1 Year		2 Years		3 Years		4 Years or More	
	No. Exam.	No.	Percent of Trees Exam.	No. Cankers Per 100 Trees	No. Trunk Cankers	No. Limb Cankers	Total No. Cankers	No.	%	No.	%	No.	%	No.	%
Clearwater	1,677	31	1.85	3.22	5	49	54	7	13	22	41.0	13	24.0	12	22.0
St. Joe	8,350	345	4.13	7.46	35	588	623	110	17.7	218	35.0	146	23.4	149	23.9
Coeur d'Alene	5,658	37	.65	1.43	6	75	81	16	19.7	38	47.0	16	19.7	11	13.6
Kaniksu	5,479	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kootenai-Cabinet	5,980	4	.07	.07	4	-	4	1	25.0	2	50.0	-	-	1	25.0
Total	27,144	417	1.54	2.81	50	712	762	134	17.6	280	35.4	175	23.0	173	22.7
Coeur d'Alene Inspection Points	3,847	166	4.32	13.62	33	491	524	130	24.8	176	33.7	111	21.1	107	20.4

The results shown in this table indicate that a dangerous condition exists in the Inland Empire with 1.54 percent of the pines infected and the percentage of infection increasing each year. In view of the fact that the amount of infection originating in 1934 and 1935 is not yet apparent the percentage of infected pines is undoubtedly higher than the table shows. The most serious situation of course exists on the Clearwater and St. Joe operations where 1.85 and 4.13 percent of the pine respectively are infected. These operations are within the optimum range of Ribes petiolare, the most damaging species of wild Ribes in the Inland Empire. Control work must be completed on areas bearing this species as soon as possible if the rust intensification is to be slowed down to the point where the growing of white pine will be profitable.

The "Time in Bark" shown in the table does not include the incubation period which is defined as that period from the time of needle infection until the discoloration becomes visible about the base of the needle fascicle. The cankers four years in the bark became visible during several years prior to 1932; those in the bark three years appeared in 1932; those in the bark two years became visible in 1933 and those in the bark one year made their appearance in 1934. While it is impossible to ascertain definitely what percentage of cankers originated during each year, it is apparent that an increasing number of cankers appeared during each year up to 1934 when the percentage dropped. This decrease may be due in part to the difficulty in locating incipient cankers which have been developing in the bark only one year or less. Experienced inspectors will miss many of these cankers, and this survey was carried on for the most part with inexperienced men and under extremely adverse weather conditions. The decrease may be due also in part to the initial effect of the large-scale control work carried on in 1933 though a very great effect could not be expected to become apparent so soon. Thirty half-mile strips on the Clearwater operation and 22 half-mile strips on the St. Joe operation were run in areas eradicated in 1933. While all of the infection on the Clearwater was found on these strips and infection was found on 50 percent of these 22 strips on the St. Joe, the Ribes eradication work may have reduced to some extent the number of cankers originating in 1933, some of which probably would have become visible by 1934.

Favorable results of the earlier Ribes eradication program have been indicated by this survey, but the dataare insufficient to draw any definite conclusions. There is little doubt, however, that a pine disease survey continued for the next several years would result in very definite information on the effect and status of the greatly enlarged control program initiated in 1933.

B. Special Pine Infection Study, Clarkia, Idaho.

In conjunction with the general pine disease survey a special strip study was conducted at Clarkia, Idaho in order to determine the extent and intensity of pine infection in that area.

This work was all done in T. 42 N., R. 42 E. Strips 13.2 feet wide were run south from the Middle Fork of St. Maries River along four section lines to points beyond the limit of pine infection on the ridge. Strip 1 was run south from Clarkia for 80 chains starting at the section corner between sections 5-6, 7-8 and run between sections 7 and 8. Strips 2, 3 and 4 were started at the Middle Fork of St. Maries River and run south on the three section lines east of Strip 1

The results shown in this table indicate that a dangerous condition exists in the Inland Empire with [illegible] percent of the pines infected and the [illegible] evidence of infection increasing each year. In view of the fact that the amount of infection originating in 1936 and 1937 is not yet apparent the percentage of infected pines is undoubtedly higher than the table shows. The most serious situation of course exists on the Clearwater and St. Joe watersheds where [illegible] and 4.1[illegible] percent of the pine respectively are infected. These conditions are within the optimum range of *Ribes petiolare*, the most dangerous species of Ribes in the Inland Empire. Control work must be completed on [illegible] species as soon as possible if the rust intensification is to be slowed down to the point where the growing of white pine will be profitable.

The "Time in Bark" shown in the table does not include the [illegible] period which is defined as that period from the time of needle infection until the discoloration becomes visible about the base of the needle fascicle. The cankers four years in the bark became visible during [illegible]; those in the bark three years appeared in 1935; those in the bark two years became visible in 1936 and those in the bark one year were first apparent in 1937. While it is impossible to ascertain definitely what percentage of cankers originated during each year, it is apparent that an increasing number of cankers appeared during each year up to 1935 when the percentage dropped. This decrease may be due in part to the difficulty in locating incipient cankers which have been only in the bark only one year or less. Experienced inspectors will miss some of these cankers, and this survey was carried on for the most part with inexperienced men and under extremely adverse weather conditions. The decrease may be due also in part to the initial effect of the large-scale control work started in 1933, though a very great effect would not be expected so [illegible]. Thirty half-mile strips on the Clearwater watershed and [illegible] half-mile strips [illegible] St. Joe watershed were run in areas worked [illegible] 1933. [illegible] on the Clearwater was found on these strips and infection was found [illegible] percent of these [illegible] strips on the St. Joe. The first eradication work may have reduced to some extent the number of cankers originating in 1935 which probably would have become visible in 1936.

[illegible] results of the earlier Ribes eradication [illegible] have been indicated by this survey, but the data are insufficient to [illegible] conclusions. There is little doubt, however, that a [illegible] for the next several years would result in much valuable information [illegible] and status of the greatly [illegible] in [illegible].

D. [illegible] Infection Study, [illegible]

In conjunction with the general [illegible] survey a [illegible] was conducted at [illegible], Idaho in order to determine the extent [illegible] pine infection in that area.

This work was all done in T. [illegible] N., R. [illegible] E. [illegible] run south from the Middle Fork of St. Maries River [illegible] points beyond the limit of pine infection [illegible]. [illegible] from Clarkia for 60 chains starting at the [illegible] 7-8 and run between sections 7 and 8. Strips 2, 3 and 4 were started at [illegible] Fork of St. Maries River and run south to the [illegible] sections [illegible].

for 112, 149 and 120 chains respectively.

The work was conducted by three-man crews as in the general survey. Data were taken by one-chain transects and all trees on the strip were examined. Canker data were taken only on trees under 15 feet in height but trees of all sizes were examined and recorded.

The results of this strip survey are shown in Table No. 2:

TABLE NO. 2

SUMMARY OF SPECIAL STRIP STUDY, CLARKIA, IDAHO

Strip No.	White Pines			Distance of Infected Trees From Streams					
				0 to 5 Chains		5 to 10 Chains		Over 10 Chains	
	Number Examined	Number Infected	Percent	No.	%	No.	%	No.	%
1	383	15	3.9	4	26.7	-	-	11	73.3
2	433	122	28.2	78	63.9	44	36.1	-	-
3	1,202	189	15.7	182	96.3	7	3.7	-	-
4	720	154	21.4	97	63.0	57	37.0	-	-
Total	2,738	480	17.5	361	75.2	108	22.5	11	2.3

The stream type Ribes on the Middle Fork of St. Maries River were eradicated in 1931 except for R. inerme. This species was left for eradication by the bulldozer method which was initiated in 1932. Both stream and upland types were worked in 1933 with an average of 24 feet of live stem per acre left on the area.

It will be seen from Table No. 2 that 17.5 percent of the pines examined were infected. It is interesting to note, however, that 75.2 percent of the infected pines are within five chains of streams, an additional 22.5 percent are within ten chains and only 2.3 percent are more than ten chains away from a stream. All of the infection included in the last classification were found on Strip 1 which runs for the most part along the ridge between the West and the Middle Fork of St. Maries River.

The heavy infection occurs from 10 to 25 chains away from the West Fork of St. Maries River running up to 25 chains on Strips 3 and 4 where the strips crossed or came near to tributary streams. Strip 2 shows typically the spread of infection from the stream type as no side streams were encountered for almost one-half mile up the ridge. On this strip, 74 of the 84 pines in the first five chains, or 88 percent, were infected. From five to ten chains from the stream 41 of the 58 pines, or 70.7 percent, were infected. Three of the five pines in Chain 11, or 60 percent, were infected and one of the five pines in Chain 16 was infected. No additional infection was found from there to Chain 50 where 3 of 6 pines adjacent to a stream were infected.

This area represents probably the center of heaviest infection in the Inland Empire over an extensive area. Twenty-four feet of Ribes live stem per acre may be too much to leave in such an infection area. It is strikingly evident, however, that the streams are a highly important factor in the intensification of

the rust even when the upland species of Ribes are concerned.

C. Scouting for Blister Rust in the Inland Empire.

During 1935 the total of known locations of pine infection in the Inland Empire was increased from 129 to 208. Of these new locations 43 were found as a result of the pine disease survey; the remaining 36 were located by the field personnel while engaged in their regular work. The known locations found to date are distributed as follows: Lolo National Forest, 1; Clearwater operation, 51; St. Joe operation, 116; Coeur d'Alene National Forest, 17; Kaniksu National Forest, 12; Cabinet National Forest, 5; Kootenai National Forest, 2 and Mount Spokane operation, 4. Eighty percent of all pine infection locations were on the Clearwater and St. Joe operations; fifty-six percent were found on the St. Joe operation alone.

Toward the close of the field season a survey of infection conditions on R. viscosissimum was performed by the field personnel on all control operations. As a result of this survey infection was found to be distributed generally over the white pine belt wherever R. viscosissimum was found with the exception of the Kootenai-Cabinet operation where no infection was found on this species. On this operation heavy infection was located, however, during the field season on R. petiolare on Lake Creek as far as the R. petiolare extended, which was for approximately one-quarter mile from Bull Lake. Heavy infection on R. inerme was found on Lake Creek for more than two miles north of Bull Lake.

The results of scouting and survey work demonstrate the fact that blister rust is intensifying at a rapid rate. During 1935 the rust was found on pine farther north on the Kaniksu operation than ever before and was found for the first time on the Kootenai National Forest in Montana where one location was found during the summer and one on the pine disease survey in the late fall.

A complete tabulation of all locations of pine infection in the Inland Empire is shown in Table No. 3. The distribution of these locations is given in the accompanying map showing "Known Locations of Pine Infection in the Inland Empire".

TABLE NO. 3

KNOWN PINE INFECTION LOCATIONS IN THE INLAND EMPIRE, 1935

County and State	Location	T.	R.	Sec.	Year Found	Year Origin
	Kaniksu National Forest					
Bonner, Idaho	Priest River	58N	5W	1	1934	*
	Moore's Creek	57N	5W	5	1935	*
	1 mile south of Chase Lake	59N	4W	26	1935	*
	Trout Creek	58N	1E	28	1935	*
Boundary, Idaho	Soldier Creek	60N	3W	27	1934	*
	Soldier Creek	60N	3W	28	1934	*
	Soldier Creek	60N	3W	24	1934	*
	Cougar Creek	60N	3W	30	1934	*
Pend Oreille, Washington	Upper West Branch Priest River	35N	45E	36	1934	*
	Middle Fork Tunnel Creek	32N	46E	7	1934	*
	North Fork Tunnel Creek	32N	46E	7	1934	*
	Gypsy Creek	39N	45E	18	1935	*
	Coeur d'Alene National Forest					
Shoshone, Idaho	South Fork Coeur d'Alene River	48N	6E	35	1931	1927
	Brown Creek	50N	3E	14	1931	1926
	Rock City Administrative Site	52N	3E	29	1932	1928-29
	Emery Creek	52N	3E	33	1932	1929
	Van Hoosier Creek	52N	2E	30	1932	1928-29
	Scott Creek	50N	2E	24	1932	1926-27
	Big Creek	51N	4E	9	1935	*
	Ucelly Creek	50N	4E	26	1935	*
	West Fork Eagle Creek	50N	4E	24	1935	*
	Deer Creek	49N	4E	22	1935	*
	½-mile strip, Placer Creek	47N	4E	12-13	1935	*
	½-mile strip, Uranus Creek	50N	4E	5-8	1935	*
	1-mile strip, Coeur d'Alene River	50N	4E	10-15 11-14	1935	*
Kootenai, Idaho	Burnt Cabin Creek	51N	1W	7,8,17,18	1932	1923
	Bottom Creek	51N	2W	11	1933	*
	Callis Creek	52N	1E	18	1934	*
	Delaney Creek	51N	1W	26	1934	1926
	St. Joe National Forest					
Shoshone, Idaho	St. Maries River	42N	2E	5,8,11	1929	1923
	Merry Creek	43N	2E	33	1930	1927
	Hammond Creek	46N	5E	25	1930	1927
	Railroad Creek	47N	5E	28	1931	1927
	Champion Creek	47N	5E	27	1931	1927
	No-Name Creek	47N	5E	34	1931	1928
	Lucky Swede Creek	46N	6E	6	1931	1927
	Little North Fork St. Joe River	46N	6E	6	1931	1927
	Ward Creek	46N	7E	20	1931	1927
	Kelly Creek	46N	7E	7	1931	1927
	Turkey Creek	46N	7E	18	1931	1927
	Cliff Creek	47N	6E	35	1931	1927
	Loop Creek	46N	6E	4	1931	1927
	Loop Creek	46N	6E	12	1931	1927
	Loop Creek	46N	7E	18	1931	1927
	St. Joe River	46N	6E	22	1931	1927
	St. Joe River	45N	6E	23	1931	1927
	Rird Creek	45N	6E	13	1931	1927
	Kyle Creek	46N	5E	13	1931	1927
	Fishhook Creek	45N	5E	17	1931	1927
	Fishhook Creek	45N	5E	17	1931	1927
	Fishhook Creek	45N	5E	20	1931	1927
	Fishhook Creek	44N	5E	4,5,8,9	1931	1923
	Slate Creek	47N	4E	36	1931	1927
	Slate Creek	46N	4E	14	1931	1927
	Slate Creek	46N	4E	27	1931	1927
	St. Joe River	45N	3E	6	1931	1927
	Pine Creek	47N	1E	13	1931	1927
	Mica Creek	44N	2E	4,5,7 8,17	1931	1923
	Marble Creek	44N	2E	34	1931	1926
	Marble Creek	44N	2E	35	1931	1927
	Rougin Creek	47N	5E	15	1932	1927-28

County and State	Location	T.	R.	Sec.	Year Found	Year Origin
	St. Joe National Forest					
Shoshone, Idaho	St. Maries River	43N	1E	36	1932	1927
	Mazie Creek	42N	1E	14	1933	1927-28
	Mazie Creek	42N	1E	23,24	1933	1927-28
	Fitzgerald Gulch	46N	1E	12	1934	*
	Cedar Creek	46N	4E	12	1934	*
	Bullion Creek	47N	5E	25	1934	*
	Kelly Creek	45N	5E	27	1934	*
	St. Joe River	45N	6E	13	1934	*
	St. Joe River	45N	6E	14	1934	*
	St. Joe River	45N	6E	24	1934	*
	Mosquito Creek	44N	8E	32	1934	*
	Tolls Creek	44N	2E	26	1934	*
	Canyon Creek	43N	7E	28	1934	*
	Whiterock Mountain	42N	3E	17	1934	*
	St. Joe River	45N	6E	21	1935	*
	St. Joe River	45N	4E	15	1935	*
	St. Joe River	45N	4E	16	1935	*
	St. Joe River	45N	4E	17	1935	*
	Placer Creek	43N	3E	32	1935	*
	Gold Center Creek	42N	3E	6	1935	*
	Middle Fork St. Maries River	42N	2E	11	1935	*
	Middle Fork St. Maries River	42N	2E	14	1935	*
	Middle Fork St. Maries River	42N	2E	26	1935	*
	Anthony Creek	42N	2E	15	1935	*
	Anthony Creek	42N	2E	16	1935	*
	Dutch Creek	42N	2E	17	1935	*
	½-mile strip, Slate Creek	46N 47N	4E 5E	36-1 31-6	1935	*
	1-mile strip, Slate Creek	47N	4E	26-35	1935	*
	1-mile strip from St. Joe City - Santa Road	46N	1E	26-35	1935	*
	½-mile strip from St. Joe City - Santa Road	45N	1E	11-14	1935	*
	1-mile strip from St. Joe City - Santa Road	45N	1E	14-23	1935	*
	1-mile strip from St. Joe City - Santa Road	45N	1E	22-28 23-27	1935	*
	1-mile strip from St. Joe City - Santa Road	45N	1E	27-34	1935	*
	1-mile strip, St. Maries River	43N	1E	14-23 15-22	1935	*
	1-mile strip, St. Maries River	43N	1E	23-26 24-25	1935	*
	1-mile strip, St. Maries River	43N	1E	25-36	1935	*
	1-mile strip, St. Maries River	43N 42N	1E 2E	36-1 31-6	1935	*
	½-mile strip, West Fork St. Maries River	42N	1E	1-12	1935	*
	1-mile strip, West Fork St. Maries River	42N	1E 2E	12-13 7-18	1935	*
	1-mile strip, West Fork St. Maries River	42N	1E	13-24	1935	*
	½-mile strip, West Fork St. Maries River	42N	1E	23-26	1935	*
Renewah, Idaho	Oleon Creek	43N	1E	16	1932	1929
	Crystal Creek	44N	1E	14,16,20 21,29,31	1932	1923
	John Creek	44N	3W	12	1935	*
	John Creek	44N	2W	8	1935	*
	½-mile strip, Thorn Canyon Creek	45N 46N	2W	36-1	1935	*
	½-mile strip, Syringa Creek	45N	2W	12-13	1935	*
	½-mile strip, Renfro Creek	44N	1E	5-8 4-9	1935	*
	1-mile strip, St. Maries River	44N	1W 1E	12-13 7-18	1935	*
	1-mile strip, St. Maries River	43N 44N	1W 1E	36-1 31-6	1935	*
	1-mile strip, St. Maries River	43N	1E	9-16	1935	*
Latah, Idaho	Emerald Creek	42N	1E	8,9 17,18	1934	*
	½-mile strip, Potlatch Creek	42N	1E	29-31	1935	*

*Year of origin not determined.

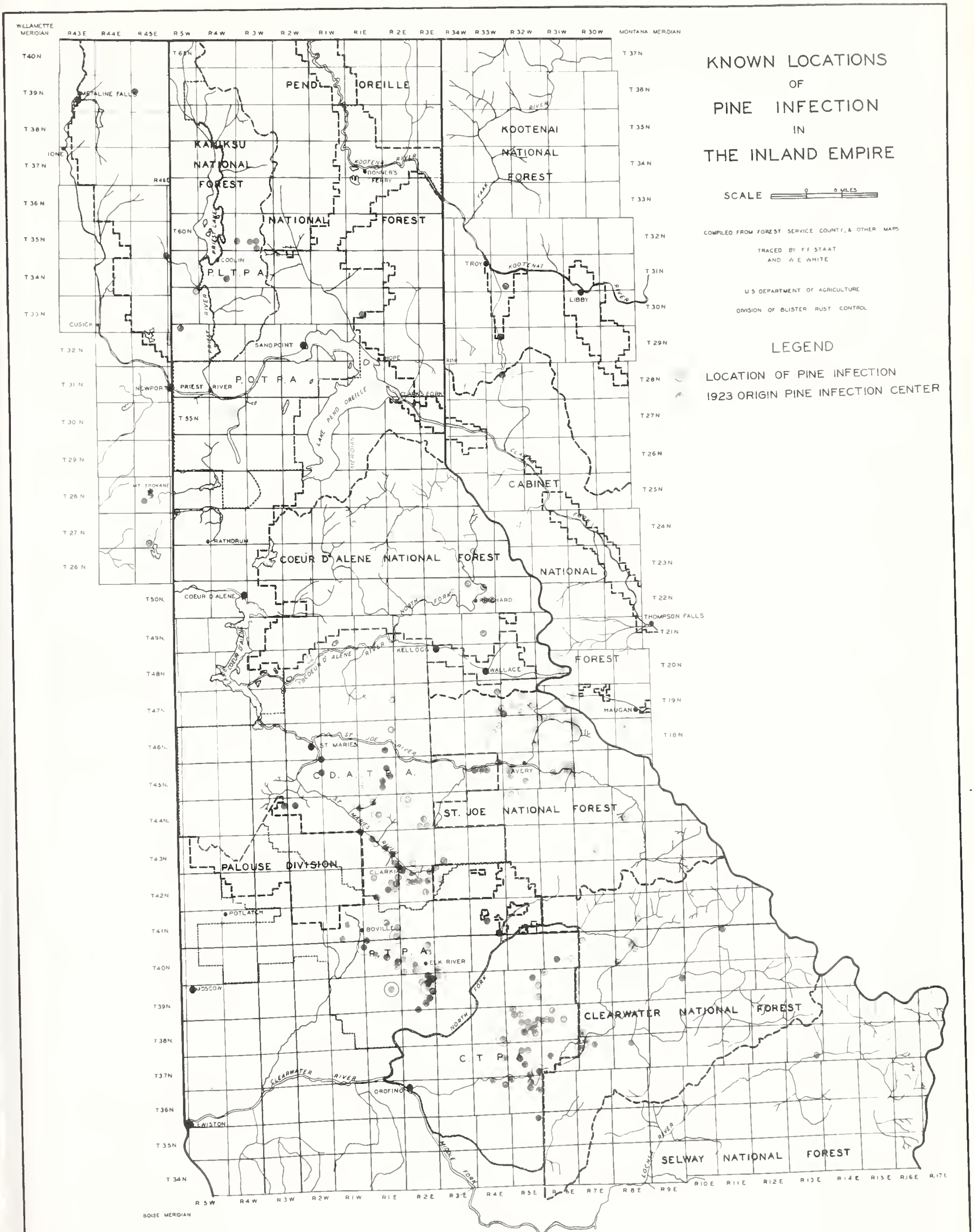
TABLE NO. 3
(continued)

KNOWN PINE INFECTION LOCATIONS IN THE INLAND EMPIRE, 1935

County and State	Location	T.	R.	Sec.	Year Found	Year Origin
	Potlatch Timber Protective Association					
Latah, Idaho	Potlatch Creek	41N	1W	22	1934	*
	Shea Meadow	41N	1W	33	1934	*
	½-mile strip, Bovill, Idaho	40N 41N	1E	36-1 31-6	1935	*
	½-mile strip, East Fork Potlatch Creek	40N	1W 1E	1-12 6-7	1935	*
Clearwater, Idaho	Deep - Elk Creeks	39N	2E	14	1929	1923
	Long Meadow - Three Bear Creeks	39N	1E	14	1929	1923
	Shattuck Creek	40N	2E	28	1930	1927
	Johnson Creek	40N	2E	19	1930	1927
	Cameron Creek	40N	1E	25	1930	1927
	Cameron Creek	40N	2E	31	1930	1927
	Cameron Creek	40N	2E	33	1931	1927
	Deep Creek	39N	3E	6	1931	1923
	Bull Run Creek	39N	2E	10	1931	1927
	Ruby Creek	40N	1E 1W	15,18,13	1931	1923
	East Fork Potlatch Creek	41N	1E	36	1931	1923
	Robs Creek	41N	1E	22	1931	1927-28
	Elk Creek	40N	2E	14	1931	1927-28
	Elk Creek	40N	2E	11	1933	1927-28
	East Fork Potlatch Creek	41N	1E	25	1933	*
	Deep Creek	40N	3E	31	1933	*
	Little North Fork Clearwater River	41N	4E	35	1935	*
	Stony Creek	41N	4E	21	1935	*
	1-mile strip, Ruby Creek	40N	1E	14-23 15-22	1935	*
	½-mile strip, Cameron Creek	40N	1E	24-25	1935	*
	Elk River	39N	2E	2	1935	*
	½-mile strip, Deep Creek	39N	2E	1-12	1935	*
	1-mile strip, Deep Creek	39N	2E	12-13	1935	*
	1-mile strip, Elk River - Dent Road	39N	2E	13-24	1935	*
	1-mile strip, Elk River - Dent Road	39N	2E	23-26 24-25	1935	*
	1-mile strip, Elk River - Dent Road	39N	2E	26-35 27-34	1935	*
	1-mile strip, Elk River - Dent Road	39N 38N	2E	33-4 34-3	1935	*
	Clearwater National Forest					
Clearwater, Idaho	Beaver Creek	40N	7E	7	1930	1927
	Weitas Creek	37N	8E	9,10	1931	1927
	Quartz Creek	40N	8E	22	1932	1927
	Skull Creek	41N	8E	26	1932	1927
	North Fork Clearwater River	40N	8E	15	1932	1927
	Quartz Creek	40N	8E	15	1932	1927
	French Creek	37N	6E 7E	24 7,18,19	1933	1923
	Orogrande Creek	37N	7E	5,6	1934	*
	Tamarack Creek	37N	7E	9	1934	*
	Larson Creek - Clearwater River	40N	8E	31	1934	*
	Forks Ranger Station	39N	9E 10E	13 18	1935	*
	North Fork Clearwater River	40N	11E	6	1935	*
	North Fork Reeds Creek	38N	5E	16	1929	1927
	North Fork Reeds Creek	38N	5E	15	1930	1927
	Quartz Creek	37N	5E	9	1930	1927

County and State	Location	T.	R.	Sec.	Year Found	Year Origin
	Clearwater National Forest					
Clearwater, Idaho	Orofino Creek	36N	5E	13	1930	1928
	Rhodes Creek	37N	5E	36	1930	1923
	Deer Creek	38N	5E	23,26	1931	1923
	Parallel Creek	38N	5E	8	1931	1927
	Casey Creek	38N	5E	5	1931	1927
	South Fork Reeds Creek	38N	5E	22	1931	1927
	South Fork Reeds Creek	38N	5E	26	1931	1927
	Snake Creek	38N	4E	36	1931	1923
	Poorman Creek	37N	4E	13	1931	1927
	Oxford Ranger Station	38N	7E	31	1932	1927
	Trail Creek	37N	5E	10	1932	1927
	Alder Creek	38N	5E	9	1932	1927
	Weaver Creek	35N	5E	1,2,11,12	1933	1927
	South Fork Reeds Creek	38N	5E	23	1933	*
	South Fork Deer Creek	38N	5E	13	1933	*
	Washington Creek	38N	6E	15	1933	*
	No-Name Creek	40N	6E	26	1933	*
	Cow Creek	36N	4E	3	1933	*
	Flume Creek	39N	6E	6	1934	*
	Alder Creek	39N	5E	25	1934	*
	Beaver Creek	39N	5E	13	1934	*
	Schofield Creek	38N	6E	4,5,8	1934	*
	Washington Creek	38N	6E	17	1934	*
	Washington Creek	38N	6E	18	1934	*
	Washington Creek	38N	6E	17	1934	*
	Beaver Creek	40N	6E	28	1935	*
	Alder Creek	39N	5E	11	1935	*
	Shanghai Ridge	37N	6E	17	1935	*
	Orofino Creek	36N	5E	6	1935	*
	Orofino Creek	36N	4E	12	1935	*
	½-mile strip, Clearwater Timber Protective Association Headquarters	38N	5E	22-27 23-26	1935	*
	1-mile strip, Quartz Creek	37N	5E	17-20 16-21	1935	*
	½-mile strip, Jaype, Idaho	37N	5E	21-28 22-27	1935	*
	1-mile strip, Orofino Creek - Canal Gulch	37N 36N	5E	34-3 35-2	1935	*
	1-mile strip, Orofino Creek	36N	5E	2-11	1935	*
	½-mile strip, Orofino Creek	36N	5E	11-14	1935	*
	Lolo National Forest					
Idaho, Idaho	Lochsa River	37N	13E	26,35	1934	*
	Cabinet National Forest					
Mineral, Montana	Big Creek	18N	30W	8	1934	1927
	Big Creek	19N	30W	33	1934	1927
	Rainy Creek	19N	32W	12	1934	*
	Deer Creek	19N	30W	25	1934	*
Sanders, Montana	½-mile strip, Bull River	28N	33W	9-16	1935	*
	Kootenai National Forest					
Lincoln, Montana	½-mile strip, Falls Creek	31N	32W	28-33	1935	*
	North end out of Bull Lake	29N	33W	8	1935	*
	Mount Spokane Operation					
Spokane, Washington	Newman Lake	26N 27N	45E	32,33 4,5	1926	1923
	Mount Spokane	28N	45E	20,21,29	1935	*
	Mount Spokane	28N	45E	21	1935	*
Kootenai, Idaho	Fish Creek	52N	5W	6	1935	*

*Year of origin not determined



KNOWN LOCATIONS
OF
PINE INFECTION
IN
THE INLAND EMPIRE
SCALE
COMPILED FROM FOREST SERVICE COUNTY, & OTHER MAPS
TRACED BY F F STAAT
AND W E WHITE
U S DEPARTMENT OF AGRICULTURE
DIVISION OF BLISTER RUST CONTROL
LEGEND
LOCATION OF PINE INFECTION
1923 ORIGIN PINE INFECTION CENTER
WILLAMETTE MERIDIAN
MONTANA MERIDIAN
BOISE MERIDIAN
PEND OREILLE NATIONAL FOREST
KANIKSU NATIONAL FOREST
KOOTENAI NATIONAL FOREST
CABINET NATIONAL FOREST
COEUR D' ALENE NATIONAL FOREST
ST. JOE NATIONAL FOREST
CLEARWATER NATIONAL FOREST
SELWAY NATIONAL FOREST
PALOUSE DIVISION
P.L.T.P.A.
P.O.T.P.A.
C.D.A.T.P.A.
P.T.P.A.
C.T.P.
METALINE FALLS
IONE
CUSICK
NEWPORT
PRIEST RIVER
COOLIN
SANDPOINT
HOPE
CLARKS FORK
BONNER'S FERRY
TROY
LIBBY
MT SPOKANE
RATHDRUM
COEUR D'ALENE
RICHARD
KELLOGG
WALLACE
THOMPSON FALLS
HAUGAN
ST MARIES
AVERY
CLARKIA
POTLATCH
BOVILL
ELK RIVER
MOSCOW
OROFINO
LEWISTON
PRIEST LAKE
LAKE PEND OREILLE
KOOTENAI RIVER
YAAK RIVER
CLARKS FORK
ST JOE RIVER
ST MARIES RIVER
COEUR D' ALENE RIVER
NORTH FORK
CLEARWATER RIVER
MIDDLE FORK
LOCHSA RIVER

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PHOTOGRAPHIC AND EDUCATIONAL WORK, 1935

By

R. L. MacLeod

Associate Pathologist

INTRODUCTION

Photographic and educational work were continued in 1935 on the same basis as shown in the 1934 Annual Report with H. Miller Cowling, assisted by Dale L. Swartz in charge of the photographic section and the writer responsible for educational work in all western states except Montana and California where State Leaders carry on the educational work with material and information supplied by the Spokane Office.

PURPOSE

The purpose of the photographic work is to maintain a record of all phases of control work, to provide the supervisory personnel of field projects with photographs and maps which will expedite control work, to reduce large charts and maps to a size satisfactory for reports or for use in the field and to provide the educational section with illustrative material. The primary purpose of the educational work is to ensure that all blister rust personnel have an adequate conception of the blister rust problem in order that the work may be carried on more efficiently. An additional purpose of this work is to provide timber owners and administrators and the general public with some knowledge of the disease, some conception of the importance of protecting threatened resources and information on the scope and progress of control work.

SUMMARY OF WORK

In considering the work accomplished during the year the photographic and educational sections are considered separately.

A. Photographic Section.

Three hundred sixty-nine field pictures were added to the files during the year. Of these 216 were ground pictures and 153 were aerial photographs. Of the ground pictures, 112 were taken in the Inland Empire, 51 in Oregon and 53 in California. These pictures are of importance in maintaining an up-to-date record of special phases of the investigative or practical control work.

The aerial photographs were secured through the cooperation of the 116th Observation Squadron, 41st Division Aviation, Washington National Guard located at Felts Field, Spokane, Washington. All of the aerial photographs secured in 1935 were taken on the Kaniksu and Coeur d'Alene operations and consisted for the most part in pictures of bulldozer operation areas taken both before and after Ribes eradication work was completed by the bulldozer method.

Photographic work in the office in addition to developing and printing the field pictures consisted in reproducing, enlarging and coloring field maps, reducing large tables and maps to annual report and special report size and producing prints and enlargements of field pictures as required for illustrative purposes and as requested by operation supervisors and cooperators.

A notable increase occurred in the demand for enlarged township maps, scale 4 inches to the mile. These township maps are used for permanent Ribes eradication records, for recording white pine data, eradication types, planting data and Ribes conditions. These maps will prove valuable in planning reeradication work. As copies of the maps will be available for field use the men supervising the work in the field will have available complete data on any area and will be able intelligently and efficiently to plan control work.

The volume of work produced by the photographic department during 1935 is shown in the following list:

Prints, 4 x 5 inches............................201
Prints, 5 x 7 inches..........................1,932
Prints, 8 x 10 inches.........................6,167
Prints, 9 x 11 inches........................13,132
Enlargements up to 20 x 24 inches..............261
Enlargements larger than 20 x 24 inches.......906
Copies, 5 x 7 inches. 40
Copies, 8 x 10 inches...........................298
Field negatives developed......................233
Rolls film No. 122, developed.....................3
75-foot rolls aerial film developed..............6
Lantern slides, plain............................71
Lantern slides, colored.........................227

B. Educational Section.

Educational work was accomplished during 1935 as shown under the following headings:

1. Illustrated Lectures.

Talks illustrated with lantern slides were given by the project leader in February and March at three of the winter CCC camps, one at Troy, Idaho, one at Chatcolet, Idaho, and one near Spokane, Washington.

During the summer illustrated talks were given at 30 CCC camps where the personnel were engaged in blister rust control work. The slides shown at these camps serve to illustrate the white pine values at stake, the action and effect of blister rust on pine and the control methods which have been developed for the protection of the pine. An understanding of the purpose of, and need for, the control program stimulates the interest of the men and helps to improve the efficiency of their work.

A lecture on blister rust was given by Mr. [illegible] Wyckoff to the Business and Professional Women's Club. Illustrated lectures were given by Mr. [illegible] Joy at the Isabella Club to a Catholic Women's Organization and by the project leader to the Forestry School, University of Idaho, the Summer School, University of Idaho, and in Spokane to the American Legion, the Boy Scout Troop at the Bethel Presbyterian Church, the Men's Club of the First Baptist Church, and to the Knights of Columbus.

2. Fairs.

Material was supplied to a committee of CCC educational advisers responsible for a Civilian Conservation Corps exhibit at the Sportsmen's and Tourist's Fair held in

Spokane in May. Space was provided in this exhibit for a blister rust demonstration comprising pictures of the disease and control work, specimens of the uredinial, telial and aecial stages and the automatic balopticon with a set of lantern slides showing all phases of the disease, white pine values at stake and control methods. The official attendance at this fair was 107,000.

3. Newspaper and Radio.

Owing to the great general public interest in the large-scale control program carried on by this division, articles concerning the scope and progress of the work appeared frequently in the Spokane newspapers. Toward the close of the field season, Mr. R. Seelig, reporter of The Spokesman-Review was taken on a four-day trip to the Clearwater operation to gain first-hand knowledge of the work. As a result an excellent feature article illustrated by pictures appeared in this newspaper.

Material and illustrations supplied to one of the feature writers of the "Portland Oregonian", Portland, Oregon, late in 1934 resulted in an excellent feature article on blister rust in that paper in January 1935.

Material and illustrations were also supplied to the Standard Oil Company for a short article on bulldozer work which appeared in the Standard Oil Bulletin in June.

A seven-minute radio talk was given by the project leader in the Farm Flash program broadcast from Station KFPY, Spokane on August 5.

4. Educational Material.

The educational material used during the year was as follows:

a. Bulletins.

Mimeographed bulletin, "Blister Rust Control in the Inland Empire", designated as BRC bulletin.

Separates from Bulletin No. 1 of write-up on life-cycle and history.

"White Pine Blister Rust - A Half Billion Dollar Menace," by Charles Lathrop Pack.

Miscellaneous Publication No. 23.

Mimeographed bulletin, "Some Characteristics of Conifers of the Inland Empire", abridged from Sudworth's "Forest Trees of the Pacific Slope" especially for use in CCC camps.

b. Specimen Material.

Dry mounts of Ribes leaves showing uredinial stage.

Dry mounts of Ribes leaves showing telial stage.

Test tubes containing specimens of discoloration stage on pine.

Test tubes containing pine specimens showing the aecial stage.

This educational material was distributed as follows:

1. Blister Rust Camps.

The more the men who are working on blister rust learn about the disease and the significance of the control program, the better work they do. In addition to the lectures noted above, the blister rust camps operating in the Inland Empire during 1935 were supplied with 1,600 copies of the mimeographed blister rust bulletin, 850 copies of the Pack bulletin, 4,200 copies of Miscellaneous Publication No. 23 and 750 copies of the bulletin on conifers. In addition, educational advisers in CCC winter camps were supplied with 10 BRC bulletins, 10 Pack bulletins, 50 copies of Miscellaneous Publication No. 23, and 4 specimens each of the uredinial, telial, discoloration and aecial stages.

2. State Leaders.

The state leader in California was supplied with 1,000 copies of the life-history separate, 850 copies of the Pack bulletin and 2,000 copies of Miscellaneous Publication No. 23. The Montana State Leader was supplied with 150 BRC bulletins, 50 Pack bulletins, 50 bulletins on conifers and 300 copies of Miscellaneous Publication No. 23. Owing to the fact that the Montana State Leader was supervising Ribes eradication work in the field, requests for information during the field season from Mr. C. T. Fowler, W.P.A. Administrator and from State Senator William Ruffcorn were supplied direct from the Spokane Office.

3. Universities and Colleges.

Sets of educational material comprising six uredinial specimens, six telial specimens, one small jar of preserved uredinial specimens and one small jar of preserved telial specimens for microscopic work, six discoloration specimens, six aecial specimens and twenty-one photographs showing the general phases of blister rust control work were made up and supplied to the University of Montana, Missoula, Montana; Colorado Agricultural College, Fort Collins, Colorado; University of Colorado Agricultural College, Fort Collins, Colorado; University of Colorado, Boulder, Colorado; Colorado College, Colorado Springs, Colorado; Marylhurst College, Oswego, Oregon; and Lewiston State Normal School, Lewiston, Idaho and Holy Names Academy, Spokane, Washington.

A set of lantern slides showing pine values, the disease and all control methods was supplied in turn to the University of Utah, Colorado Agricultural College, University of Colorado, Colorado College and the University of Wyoming.

Fifty copies of Miscellaneous Publication No. 23 and 25 copies of the BRC bulletin were supplied to R. T. d'Urbal, a representative of this division at the University of Idaho, Moscow, Idaho, to supply any requests for blister rust information. A set of 30 photographs was supplied to the Forestry School, University of Idaho to bring their information files up-to-date. No additional specimen material was required.

High Schools at Rockland, Idaho, Coquille and The Dalles, Oregon, Oakesdale, Washington, the Lincoln High School, Seattle, Washington and the Medford Public Library, Medford, Oregon were supplied with [illegible] BRC bulletins, 6 Pack bulletins and 20 copies of Miscellaneous Publication No. 23.

4. General Public.

Work with the general public except for illustrated lectures, was confined to filling requests as received for blister rust material or information. Twenty-eight BRC bulletins, 32 Pack bulletins, 47 copies of Miscellaneous Publication No. 23 and 27 copies of the life history write-up were supplied in response to 38 requests from individuals for information on white pine blister rust.

EXPENDITURES BY THE WESTERN DIVISION OF BLISTER RUST CONTROL CALENDAR YEAR 1935

Federal and State Expenditures

The following tabulations of Federal expenditures for the periods July 1, 1935 to December 31, 1935 regular funds; January 1, 1935 to June 30, 1935 NIRA funds; July 1, 1935 to December 31, 1935 NIRA funds, and July 1, 1935 to December 31, 1935 ERA funds, summarize by projects and objects the expenditures for the Western Division of Blister Rust Control.

These tabulations are prepared from detailed expenditure card records maintained by fiscal years for each project which show the classification of all expenditures as to objects of expenditure, based on the expenditure classifications required by the Bureau of the Budget and General Accounting Office.

In addition to the expenditures shown by the following tabulations, disbursements were made during the calendar year 1935 by the regional fiscal agent, San Francisco, from the $186,000 transferred to the Forest Service for disbursement on April 10, 1934 in the amount of $10,562.18, details of which are given in Mr. Benedict's report.

In addition to the above Federal expenditures, the State of Idaho contributed $15,000 for blister rust control work which were expended for wages of laborers employed by the State.

Disbursements of NIRA funds, State of Idaho contributed funds, and regular funds through October 31, 1935 were made by Miss M. L. McNold from the Spokane office. Disbursements of regular funds beginning November 1, 1935 were made by Howard S. Knapp, Regional Disbursing Officer, Seattle, Washington. Disbursements of the ERA funds were made for the Inland Empire and Rocky Mountain operations by P. Chalmers, Disbursing Clerk, Seattle, Washington and for the Oregon and California operations by L. S. McCracken, Regional Disbursing Officer, San Francisco, California.

EXPENDITURES BY THE
WESTERN DIVISION OF BLISTER RUST CONTROL
CALENDAR YEAR 1935

Federal and State Expenditures

The following tabulations of Federal expenditures for the periods July 1, 1935 to December 31, 1935 regular funds; January 1, 1935 to June 30, 1935 NIRA funds; July 1, 1935 to December 31, 1935 NIRA funds, and July 1, 1935 to December 31, 1935 ERA funds, summarize by projects and objects the expenditures for the Western Division of Blister Rust Control.

These tabulations are prepared from detailed expenditure cost records maintained by fiscal years for each project which show the classification of all expenditures as to objects of expenditure, based on the expenditure classification required by the Bureau of the Budget and General Accounting Office.

In addition to the expenditures shown by the following tabulations, disbursements were made during the calendar year 1935 by the Regional Fiscal Agent, San Francisco, from the [illegible] transferred to the Forest Service for allotment on April 10, 1934 in the amount of [illegible], details of which are given in Mr. Benedict's report.

In addition to the above Federal expenditures, the State of Idaho contributed $10,000 for blister rust control work which was expended for wages of laborers employed by the State.

Disbursements of NIRA funds, State of Idaho contributed funds, and regular funds through October 31, 1935 were made by Miss W. L. [illegible] from the Spokane office. Disbursements of regular funds beginning November 1, 1935 were made by Howard S. Knapp, Regional Disbursing Officer, Seattle, Washington. Disbursements of the ERA funds were made for the Inland Empire and Rocky Mountain operations by F. Chalmers, Disbursing Clerk, Seattle, Washington and for the Oregon and California operations by [illegible], Regional Disbursing Officer, San Francisco, California.

TABLE NO. 1

FEDERAL EXPENDITURES, WESTERN DIVISION OF BLISTER RUST CONTROL
JULY 1, 1935 - DECEMBER 31, 1935, REGULAR APPROPRIATION

	Project	Salaries	Expenses	Total	Recapitulation of Expenses: Equip-ment	Recapitulation of Expenses: Other Supplies	Recapitulation of Expenses: Transportation and Travel
2.3	Developing and Testing Ribicides						
	2.3-1 - Laboratory Investigations, Ribicides	$ 4,984.93	$ 183.13	$ 5,168.06	$ 1.98	$ 7.34	$ 173.81
2.4	Field Studies in Ribes Ecology						
	2.42 - Idaho	566.66	98.30	664.96		20.00	78.30
3.2	Cooperative Ribes Eradication on Federal Lands						
	3.21-2 & 3.21-3 Cabinet-Kootenai National Forests, Montana	1,908.93	87.00	1,995.93		1.50	85.50
	3.23-1 - Kaniksu National Forest, Washington	216.66	26.01	242.67		1.21	24.80
3.4	Cooperative Ribes Eradication on Private and State Lands						
	3.42-1 - Clearwater Operation, Idaho	2,349.89	177.42	2,527.31		54.59	122.83
	3.42-2 - St. Joe Operation, Idaho	2,446.99	125.80	2,572.79		63.21	62.59
	3.42-3 - Coeur d'Alene Operation, Idaho	2,798.33	146.64	2,944.97		29.28	117.36
	3.42-4 - Kaniksu Operation, Idaho	2,366.07	186.53	2,552.60		39.40	147.13
	3.43-2 - Mount Spokane Operation, Washington	1,081.44	23.28	1.104.72		.40	22.88
	3.44 - Rogue River Operation, Oregon	1,203.30	73.96	1,277.26		2.76	71.20
	3.45-1 - Plumas Operation, California	2,313.27	301.85	2,615.12		273.55	28.30
	3.45-2 - Sierra Operation, California	3,668.25	5.44	3,673.69		5.44	
	3.45-3 - Eldorado Operation, California	2,879.93	100.67	2,980.60		95.89	4.78
	3.45-4 - Stanislaus Operation, California	2,999.93	41.56	3,041.49		40.66	.90
	3.46 - Washakie Operation, Wyoming	722.20		722.20			
	3.47 - Pike Operation, Colorado	866.85	38.87	905.72		8.24	30.63
4.1	Field Studies, Spread of the Rust						
	4.15 - California	1,884.33	51.15	1,935.48		49.45	1.70
6.	Educational Work, Spokane Office	2,691.62	79.44	2,771.06		57.80	21.64
9.	Maintenance of Field Office and Miscellaneous Expenses						
	9.1 - Supervision	2,299.92	169.74	2,469.66		50.25	119.49
	9.2 - Office Maintenance	7,152.19	692.58	7,844.77		632.04	60.54
	9.3 - Miscellaneous Supplies and Services Paid on L/A	37.80	24.21	62.01		20.35	3.86
	9.4 - Purchases made in Washington, D. C.		3.00	3.00		3.00	
	Grand Total July 1, 1935 - December 31, 1935	$47,439.49	$2,636.58	$50,076.07	$1.98	$1,456.36	$1,178.24

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TABLE NO. 2

FEDERAL EXPENDITURES, WESTERN DIVISION OF BLISTER RUST CONTROL
JANUARY 1, 1935 - JUNE 30, 1935, NIRA APPROPRIATION

				Recapitulation of Expenses			
Project	Salaries	Expenses	Total	Subsistence Supplies	Equip-ment	Other Supplies	Transportation and Travel
F.P. 209 Idaho							
7.22-2M Ribes Eradication (Methods) St. Joe National Forest	$ 1,302.64	$ 48.78	$ 1,351.42	$	$	$ 24.83	$ 23.95
7.22-3 Cooperative Ribes Eradication, Coeur d'Alene National Forest		10.03	10.03			8.33	1.70
7.2-3 Developing and Testing Ribicides	1,321.19	60.79	1,381.98			38.12	22.67
7.2-42 Field Studies in Ribes Ecology	688.75	5.40	694.15				5.40
7.42-1 Cooperative Ribes Eradication, Clearwater Operation	10,298.10	2,646.65	12,944.75	34.31	245.10	1,190.92	1,176.32
7.42-2 Cooperative Ribes Eradication, St. Joe Operation	9,780.90	2,445.44	12,226.34	71.85	462.12	1,167.09	744.38
7.42-3 Cooperative Ribes Eradication, Coeur d'Alene Operation	5,596.13	1,323.78	6,919.91		166.21	643.19	514.38
7.42-4 Cooperative Ribes Eradication, Kaniksu Operation	5,730.82	5,459.13	11,189.95	3,691.34	185.81	1,107.24	474.74
7.6 Educational Work	1,587.08	524.88	2,111.96			513.81	11.07
7.7 Summarization of Field Data	3,179.94	22.88	3,202.82			13.06	9.60
7.9-3 Supplies and Services Paid under L/A		40.29	40.29			40.29	
Total F.P. 209 Idaho	39,485.55	12,588.05	52,073.60	3,797.50	1,059.24	4,746.90	2,984.41
F.P. 210 Montana							
7.21-1 Savenac Nursery		16.80	16.80				16.80
7.21-2 Cooperative Ribes Eradication, Cabinet National Forest	1,432.74	3,218.20	4,650.94	133.33	84.34	2,555.63	444.90
7.21-3 Cooperative Ribes Eradication, Kootenai National Forest	2,110.05	5,985.16	8,095.23	266.67	149.03	5,061.04	505.44
7.6 Educational	977.11	192.18	1,169.29		40.50	149.40	2.28
7.9-3 Supplies and Services Paid under L/A		7.96	7.96			7.96	
Total F.P. 210 Montana	4,519.90	9,420.32	13,940.22	400.00	273.67	7,774.03	972.42
F.P. 211 Washington							
7.2-3 Developing and Testing Ribicides		4.02	4.02			.87	3.15
7.23-1 Cooperative Ribes Eradication, Kaniksu National Forest	3,121.38	5,395.60	8,516.98	160.00	230.10	4,701.63	303.87
7.33-1 Cooperative Ribes Eradication, Mount Rainier National Park		22.89	22.89				22.69
7.43-2 Cooperative Ribes Eradication, Mount Spokane Operation	618.40	1,275.80	1,894.20	40.00	23.25	1,141.25	71.30
7.6 Educational Work	1,414.02	176.56	1,590.58			29.77	146.79
7.7 Summarization of Field Data	190.00	198.94	388.94			73.38	125.56
7.9-2 Spokane Office Maintenance and Supplies	472.20		472.20				
7.9-3 Supplies and Services Paid under L/A	46.80	6.47	53.27			6.47	
7.9-4 Supplies and Services Paid in Washington, D.C.		43.15	43.15		43.15		
Total F.P. 211 Washington	5,862.80	7,123.43	12,986.23	200.00	296.50	5,953.37	673.56
F.P. 212 California							
7.15 Field Studies, Spread of the Rust	1,695.27	431.75	2,127.02	184.28	82.50	59.43	105.54
7.2-3 Developing and Testing Ribicides	4,975.35	978.83	5,954.18		191.49	413.93	373.41
7.315-1 Control Reconnaissance on Federal Lands (Yosemite)		91.49	91.49				91.49
7.315-2 Control Reconnaissance on Federal Lands (Sierra)		6.63	6.63				6.63
7.45-1 Cooperative Ribes Eradication, Plumas Operation	4,018.94	1,715.31	5,734.25	356.03	667.46	371.72	320.10
7.45-2 Cooperative Ribes Eradication, Sierra Operation	4,839.79	1,485.73	6,325.52	24.71	644.67	519.88	296.47
7.45-3 Cooperative Ribes Eradication, Eldorado Operation	6,169.08	2,703.16	8,872.24	333.28	1,501.09	366.91	501.86
7.45-4 Cooperative Ribes Eradication, Stanislaus Operation	4,883.01	2,070.85	6,953.86	170.84	1,054.67	366.82	478.52
7.6 Educational Work		80.54	80.54			80.54	
7.9-3 Supplies and Services Paid under L/A	142.20	10,940.20	11,082.40			10,930.72	9.48
Total F.P. 212 California	26,723.64	20,504.49	47,228.13	1,069.14	4,141.88	13,109.95	2,183.52
F.P. 213 Oregon							
7.44 Cooperative Ribes Eradication, Rogue River Operation		1,011.50	1,011.50			1,011.50	
Total F.P. 213 Oregon		1,011.50	1,011.50			1,011.50	
F.P. 128 Oregon (Physical Improvements Allotment)							
7.44 Cooperative Ribes Eradication, Rogue River Operation	1,981.24	6,492.64	8,473.88	227.66	3,788.00	1,707.95	769.03
7.6 Educational Work	99.00		99.00				
7.9-2 Spokane Office Maintenance and Supplies	1,579.44	450.00	2,029.44			450.00	
7.9-3 Supplies and Services Paid under L/A	240.00	22.50	262.50			22.50	
Total F.P. 128 Oregon	3,899.68	6,965.14	10,864.82	227.66	3,788.00	2,180.45	769.03
F.P. 214 Wyoming							
7.316-1 Control Reconnaissance on Federal Lands, Wyoming		30.60	30.60		2.08	24.35	4.17
7.7 Summarization of Field Data	1,534.10	571.00	2,105.10	500.00		1.00	70.00
7.9-3 Supplies and Services Paid under L/A		2.77	2.77			2.77	
Total F.P. 214 Wyoming	1,534.10	604.37	2,138.47	500.00	2.08	28.12	74.17
F.P. 215 Colorado							
7.317-1 Control Reconnaissance on Federal Lands, Colorado		15.11	15.11		3.31	10.25	1.55
7.7 Summarization of Field Data	1,293.28	286.75	1,580.03			286.75	
7.9-3 Supplies and Services Paid under L/A		10.75	10.75			10.75	
Total F.P. 215 Colorado	1,293.28	312.61	1,605.89		3.31	307.75	1.55
F.P. 261 General Expenses, Spokane Office							
7.2-3 Developing and Testing Ribicides		17.51	17.51				17.51
7.6 Educational Work		153.43	153.43		6.50	136.94	9.99
7.9-1 Supervision	2,242.44	254.15	2,496.59			32.52	221.63
7.9-2 Office Maintenance	9,103.58	1,966.36	11,069.94			1,984.96	1.50
7.9-3 Supplies and Services Paid under L/A		1,019.36	1,019.36	679.60	2.08	314.17	23.51
7.9-4 Supplies and Services Paid in Washington, D.C.		430.85	430.85		383.12	47.73	
7.9-9 Indirect Expenses		8,049.27	8,049.27		519.32	7,529.95	
Total F.P. 261	11,346.02	11,910.93	23,256.95	679.60	911.02	10,046.17	274.14
Grand Total January 1, 1935 to June 30, 1935	94,664.97	70,440.94	165,105.91	6,873.90	10,475.90	45,158.24	7,932.80

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TABLE NO. 3

FEDERAL EXPENDITURES, WESTERN DIVISION OF BLISTER RUST CONTROL
JULY 1, 1935 - DECEMBER 31, 1935, NIRA APPROPRIATION

Project	Salaries	Expenses	Total	Recapitulation of Expenses		
				Subsistence Supplies	Supplies	Transportation and Travel
F.P. 209 Idaho						
7.2-3 Developing and Testing Ribicides	$	$ 1.86	$ 1.86	$	$	$ 1.86
7.42-1 Cooperative Ribes Eradication, Clearwater Operation	320.26	58.03	378.29		5.99	52.04
7.42-2 Cooperative Ribes Eradication, St. Joe Operation		8.30	8.30		8.30	
7.42-3 Cooperative Ribes Eradication, Coeur d'Alene Operation	119.26	3.15	122.41		3.15	
7.42-4 Cooperative Ribes Eradication, Kaniksu Operation		138.29	138.29	122.09	11.70	4.50
7.6 Educational Work		1.22	1.22			1.22
7.7 Summarization of Field Data	200.51		200.51			
7.9-3 Supplies and Services Paid under L/A	171.00	3.12	174.12			3.12
Total F.P. 209 Idaho	811.03	213.97	1,025.00	122.09	29.14	62.74
F.P. 210 Montana						
7.41-2 and 7.41-3 Cooperative Ribes Eradication Cabinet-Kootenai Operation	10.00	32.82	42.82	31.68		1.14
7.9-2 Spokane Office Maintenance and Supplies	100.00		100.00			
7.9-3 Supplies and Services Paid under L/A		7.18	7.18			7.18
Total F.P. 210 Montana	110.00	40.00	150.00	31.68		8.32
F.P. 211 Washington						
7.43-2 Cooperative Ribes Eradication, Mount Spokane Operation	117.68	7.32	125.00			7.32
Total F.P. 211 Washington	117.68	7.32	125.00			7.32
F.P. 212 California						
7.15 Field Studies, Spread of the Rust	7.92	49.74	57.66		49.74	
7.2-3 Developing and Testing Ribicides		18.50	18.50		16.20	2.30
7.45-1 Cooperative Ribes Eradication, Plumas Operation	16.00	132.43	148.43		70.27	62.16
7.45-2 Cooperative Ribes Eradication, Sierra Operation	16.00	196.93	212.93		165.21	31.72
7.45-3 Cooperative Ribes Eradication, Eldorado Operation	16.00	161.67	177.67		102.89	58.78
7.45-4 Cooperative Ribes Eradication, Stanislaus Operation	16.00	26.08	42.08			26.08
Total F.P. 212 California	71.92	585.35	657.27		404.31	181.04
F.P. 128 Oregon (Physical Improvements Allotment)						
7.44 Cooperative Ribes Eradication, Rogue River Operation	68.65	122.90	191.55		120.08	2.82
Total F.P. 128 Oregon	68.65	122.90	191.55		120.08	2.82
F.P. 261 General Expenses, Spokane Office						
7.9-2 Office Maintenance	80.84	167.59	248.43		167.59	
Total F.P. 261	80.84	167.59	248.43		167.59	
Grand Total July 1, 1935 to December 31, 1935	$1,260.12	$1,144.31	$2,404.43	$153.77	$721.12	$269.42

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TABLE NO. 3

FEDERAL EXPENDITURES, WESTERN DIVISION OF BLISTER RUST CONTROL
JULY 1, 1935 - DECEMBER 31, 1935, NIRA APPROPRIATION

Project	Salaries	Expenses	Total	Recapitulation of Expenses		
				Subsistence Supplies	Supplies	Transportation and Travel
F.P. 209 Idaho						
7.2-3 Developing and Testing Ribicides	$	$ 1.86	$ 1.86	$	$	$ 1.86
7.42-1 Cooperative Ribes Eradication, Clearwater Operation	320.26	58.03	378.29		5.99	52.04
7.42-2 Cooperative Ribes Eradication, St. Joe Operation		8.30	8.30		8.30	
7.42-3 Cooperative Ribes Eradication, Coeur d'Alene Operation	119.26	3.15	122.41		3.15	
7.42-4 Cooperative Ribes Eradication, Kaniksu Operation		138.29	138.29	122.09	11.70	4.50
7.6 Educational Work		1.22	1.22			1.22
7.7 Summarization of Field Data	200.51		200.51			
7.9-3 Supplies and Services Paid under L/A	171.00	3.12	174.12			3.12
Total F.P. 209 Idaho	811.03	213.97	1,025.00	122.09	29.14	62.74
F.P. 210 Montana						
7.41-2 and 7.41-3 Cooperative Ribes Eradication Cabinet-Kootenai Operation	10.00	32.82	42.82	31.68		1.14
7.9-2 Spokane Office Maintenance and Supplies	100.00		100.00			
7.9-3 Supplies and Services Paid under L/A		7.18	7.18			7.18
Total F.P. 210 Montana	110.00	40.00	150.00	31.68		8.32
F.P. 211 Washington						
7.43-2 Cooperative Ribes Eradication, Mount Spokane Operation	117.68	7.32	125.00			7.32
Total F.P. 211 Washington	117.68	7.32	125.00			7.32
F.P. 212 California						
7.15 Field Studies, Spread of the Rust	7.92	49.74	57.66		49.74	
7.2-3 Developing and Testing Ribicides		18.50	18.50		16.20	2.30
7.45-1 Cooperative Ribes Eradication, Plumas Operation	16.00	132.43	148.43		70.27	62.16
7.45-2 Cooperative Ribes Eradication, Sierra Operation	16.00	196.93	212.93		165.21	31.72
7.45-3 Cooperative Ribes Eradication, Eldorado Operation	16.00	161.67	177.67		102.89	58.78
7.45-4 Cooperative Ribes Eradication, Stanislaus Operation	16.00	26.08	42.08			26.08
Total F.P. 212 California	71.92	585.35	657.27		404.31	181.04
F.P. 128 Oregon (Physical Improvements Allotment)						
7.44 Cooperative Ribes Eradication, Rogue River Operation	68.65	122.90	191.55		120.08	2.82
Total F.P. 128 Oregon	68.65	122.90	191.55		120.08	2.82
F.P. 261 General Expenses, Spokane Office						
7.9-2 Office Maintenance	80.84	167.59	248.43		167.59	
Total F.P. 261	80.84	167.59	248.43		167.59	
Grand Total July 1, 1935 to December 31, 1935	$1,260.12	$1,144.31	$2,404.43	$153.77	$721.12	$269.42

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TABLE NO. 4

FEDERAL EXPENDITURES, WESTERN DIVISION OF BLISTER RUST CONTROL
JULY 23, 1935 - DECEMBER 31, 1935, ERA APPROPRIATION

Project	Salaries	Expenses	Total	Recapitulation of Expenses			
				Subsistence Supplies	Equipment	Other Supplies	Transportation and Travel
OP-1-147, Montana							
8.41-2 and 8.41-3 Cooperative Ribes Eradication Cabinet-Kootenai Operation	$ 35,410.14	$ 19,091.44	$ 54,501.58	$ 13,647.32	$ 1,046.37	$ 2,395.43	$ 2,002.32
8.9-2 Spokane Office Maintenance and Supplies		39.39	39.39			15.69	23.70
8.9-3 Supplies and Services		1.65	1.65			1.65	
Total OP-1-147, Montana	35,410.14	19,132.48	54,542.62	13,647.32	1,046.37	2,412.77	2,026.02
OP-1-140, Idaho							
8.2-3 Developing and Testing Ribicides		402.40	402.40			42.65	359.75
8.42-1 Cooperative Ribes Eradication, Clearwater Operation	41,914.89	20,599.74	62,514.63	10,496.05	5,486.38	2,613.23	2,004.08
8.42-2 Cooperative Ribes Eradication, St. Joe Operation	35,545.29	14,144.99	49,690.28	10,381.82	883.13	927.98	1,952.06
8.42-3 Cooperative Ribes Eradication, Coeur d'Alene Operation	22,393.47	10,969.08	33,362.55	7,294.00	1,785.24	797.85	1,091.99
8.42-4 Cooperative Ribes Eradication, Kaniksu Operation	39,643.10	24,126.16	63,769.26	10,239.61	9,682.04	2,294.31	1,910.20
8.6 Educational Work		227.73	227.73			127.02	100.71
8.7 Summarization of Field Data	161.10		161.10				
8.9-1 Supervision		95.65	95.65				95.65
8.9-2 Spokane Office Maintenance and Supplies		279.87	279.87			279.87	
8.9-3 Supplies and Services		302.28	302.28			300.53	1.75
Total OP-1-140, Idaho	139,657.85	71,147.90	210,805.75	38,411.48	17,836.79	7,383.44	7,516.19
OP-1-160, Washington							
8.2-3 Developing and Testing Ribicides		3.75	3.75				3.75
8.33-1 Cooperative Ribes Eradication, Mount Rainier National Park		69.90	69.90				69.90
8.43-2 Cooperative Ribes Eradication, Mount Spokane Operation	48,866.80	17,627.63	66,494.43	13,497.35	523.84	2,043.50	1,562.94
8.6 Educational Work	715.00	175.89	890.89			63.35	112.54
8.7 Summarization of Field Data	1,512.59	105.19	1,617.78			50.00	55.19
8.9-2 Spokane Office Maintenance and Supplies	8,694.91	103.13	8,798.04			5.33	97.80
8.9-3 Supplies and Services		1,555.30	1,555.30			1,496.23	59.07
Total OP-1-160, Washington	59,789.30	19,640.79	79,430.09	13,497.35	523.84	3,658.41	1,961.19
OP-1-153, Oregon							
8.44 Cooperative Ribes Eradication, Rogue River Operation	50,378.37	26,515.41	76,893.78	15,531.09	7,297.45	1,826.70	1,860.17
Total OP-1-153, Oregon	50,378.37	26,515.41	76,893.78	15,531.09	7,297.45	1,826.70	1,860.17
OP-1-136, California							
8.15 Field Studies, Spread of the Rust	157.52	276.46	433.98				276.46
8.2-3 Developing and Testing Ribicides	164.79		164.79				
8.315 Control Reconnaissance on Federal Lands							
8.45-1 Cooperative Ribes Eradication, Plumas Operation	49,778.46	28,530.36	78,308.82	20,556.92	4,713.61	1,679.71	1,580.12
8.45-2 Cooperative Ribes Eradication, Sierra Operation	41,177.97	24,415.91	65,593.88	16,133.26	4,713.61	2,321.71	1,247.33
8.45-3 Cooperative Ribes Eradication, Eldorado Operation	39,704.73	19,764.34	59,469.07	12,991.36	4,713.61	473.88	1,585.49
8.45-4 Cooperative Ribes Eradication, Stanislaus Operation	36,535.20	20,558.59	57,093.79	13,240.88	4,713.60	1,156.29	1,447.82
8.9-4 Oakland Office Maintenance and Supplies	5,819.00	3,434.13	9,253.13			2,756.00	678.13
Total OP-1-136, California	173,337.67	96,979.79	270,317.46	62,922.42	18,854.43	8,387.59	6,815.35
OP-1-163, Wyoming							
8.46 Cooperative Ribes Eradication, Washakie Operation	3,842.36	3,865.33	7,707.69	1,345.99	1,273.19	341.91	904.24
Total OP-1-163, Wyoming	3,842.36	3,865.33	7,707.69	1,345.99	1,273.19	341.91	904.24
OP-1-137, Colorado							
8.47 Cooperative Ribes Eradication, Pike Operation	6,711.95	4,189.36	10,901.31	2,028.93	1,316.58	406.80	437.05
Total OP-1-137, Colorado	6,711.95	4,189.36	10,901.31	2,028.93	1,316.58	406.80	437.05
Grand Total July 23, 1935 - December 31, 1935	$469,127.64	$241,471.06	$710,598.70	$147,384.58	$48,148.65	$24,417.62	$21,520.21

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GENERAL SUMMARY, WESTERN CONTROL PROGRAM, 1935.

Introduction

During the early part of the field season of 1935 control work was carried on in the Inland Empire by 4,141 men in 37 ECW camps, 390 men in 12 regular Forest Service camps, 24 men in 2 bulldozer camps operated under regular Forest Service funds and 64 men in two cooperative state camps, the State of Idaho and the Bureau of Entomology and Plant Quarantine cooperating. In Mount Rainier National Park 70 men in three ECW camps were engaged in blister rust control.

With the allotment of funds during the latter part of July from the Emergency Relief Administration to the Bureau of Entomology and Plant Quarantine and to the Forest Service, the scope of the work was increased. In the Inland Empire 2,879 men were employed in 46 ERA camps; in Oregon 450 men in 6 camps were engaged in Ribes eradication; in California 1,862 men in 22 camps were employed in blister rust control; in Colorado one camp of 48 men and in Wyoming one camp of 44 men were operated.

In the West, therefore, 9,972 men in 132 camps were employed in blister rust control work during the field season of 1935.

Spread of Blister Rust

During 1935 blister rust was discovered again on Ribes bracteosum at the same site in Curry County, Oregon where it was found in 1929 and 1931 in T. 33 S., R. 15 W., Section 25, Willamette Meridian. It was found also in the same township in Sections 19 and 20. These locations are approximately 50 miles from the California-Oregon line. It was found also on R. bracteosum about 65 miles from the California line on the Rogue River National Forest in Jackson County.

In the Inland Empire blister rust was found to be generally distributed on R. viscosissimum. Heavy infection was found on R. petiolare and on R. inerme on Lake Creek north of Bull Lake on the Kootenai National Forest. The number of known locations of pine infection was increased from 129 to 208 distributed as follows: Lolo National Forest, 1; Clearwater operation, 51; St. Joe operation, 116; Coeur d'Alene National Forest, 17; Kaniksu National Forest, 12; Cabinet National Forest, 5; Kootenai National Forest, 2 and Mount Spokane operation, 4. These discoveries represent a slight extension of known locations westward to the Mount Spokane area, northward on the Kaniksu National Forest in Idaho and pine infection was located for the first time on the Kootenai National Forest in Montana.

Application of Local Control Measures.

Ribes Eradication - Inland Empire.

On the Clearwater operation 914 men in 5 ECW camps, 200 men in 6 regular Forest Service camps and 628 men in 7 EQ-ERA and 3 FS-ERA camps were engaged in Ribes eradication work, a total of 1,742 men in 21 camps.

On the St. Joe operation 1,070 men were employed in 7 ECW camps, 190 men in 6 regular Forest Service camps and 355 men in 5 EQ-ERA and one FS-ERA camp, a total of 1,615 men in 19 camps.

On the Coeur d'Alene operation 1,392 men in 14 ECW camps, 564 men in 4 EQ-ERA and 5 FS-ERA camps and 9 men in one bulldozer camp were employed, a total of 1,965 men in 24 camps.

On the Kaniksu operation 625 men in 9 ECW camps, 544 men in 6 EQ-ERA and 5 FS-ERA camps, 64 men in 2 cooperative state camps and 15 men in one bulldozer camp were engaged in blister rust control, a total of 1,248 men in 22 camps.

On the Montana operation in the Kootenai and Cabinet National Forests 140 men in 2 ECW camps and 386 men in 6 EQ-ERA camps were employed, a total of 526 men in 8 camps.

Ribes eradication work was initiated in 1935 on the Mount Spokane area where 402 men were employed in 5 EQ-ERA camps.

The results of Ribes eradication work during 1935 and since the inception of the work are shown in the following summary tables:

SUMMARY OF RIBES ERADICATION, INLAND EMPIRE, 1935.

Operation	Acres First Working	Acres Second Working	Acres Third Working	Effective Man Days	Total Ribes
Clearwater	41,628	7,375	446	44,267	8,640,835
St. Joe	60,550	1,940	762	54,639	23,149,556
Coeur d'Alene	58,961	1,995		74,116	11,302,235
Kaniksu	58,927	1,459		36,561	5,139,536
Mt. Spokane	9,855			10,803	2,981,851
Montana	26,020	473		13,545	2,025,855
Total	255,941	13,242	1,208	233,931	53,239,868

SUMMARY OF RIBES ERADICATION, INLAND EMPIRE, 1923-1935

Operation	Acres First Working	Acres Second Working	Acres Third Working	Effective Man Days	Total Ribes
Clearwater	324,711	20,707	1,657	266,773	69,196,015
St. Joe	343,288	8,405	1,298	291,516	86,758,383
Coeur d'Alene	262,021	17,593		280,441	46,093,113
Kaniksu	313,223	10,003		133,540	30,632,966
Mt. Spokane	9,855			10,803	2,981,851
Montana	71,391	1,092	619	43,090	9,681,545
Total	1,324,489	57,800	3,574	1,026,163	245,343,873

Ribes Eradication - Washington.

The work done in Washington on the Mount Spokane control area and on the Kaniksu operation is included in the report for the Inland Empire. In addition 70 men in 3 ECW camps on Mount Rainier National Park were employed for 2,923 man days in eliminating 274,518 Ribes from 2,327 acres of white pine type, an average of 1.26 man days and 118 Ribes per acre.

Since the inception of the work on Mount Rainier National Park in 1930, 4,298 acres have been worked initially and 1,723 acres given a second working. The Ribes eradicated total 1,343,966 in 9,470 effective man days of work.

Ribes Eradication - Oregon.

On the Rogue River National Forest 450 men in 6 ERA camps eradicated 2,448,659 Ribes from 18,915 acres in 9,572 effective man days. An average of 129 Ribes per acre was eliminated at a cost of $4.50 per acre.

Ribes Eradication - California.

Ribes eradication in California was carried on by 1,862 men in 22 camps distributed as follows: Plumas operation, 6; Eldorado operation, 5; Stanislaus operation, 5 and Sierra operation, 6 camps.

The results of Ribes eradication in 1935 are shown in the following table:

SUMMARY OF RIBES ERADICATION, CALIFORNIA, 1935

Operation	Acres First Working	Acres Second Working	Effective Man Days	Total Ribes	First Working Ribes Per Acre	First Working Cost Per Acre	Second Working Ribes Per Acre	Second Working Cost Per Acre
Plumas N.F.	28,631	390	12,633	3,067,059	104	$ 3.05	247	$4.52
Eldorado N.F.	18,996		9,063	2,749,979	145	3.77		
Stanislaus N.F.	19,229	895	10,660	3,924,806	200	3.57	82	3.82
Sierra N.F.	6,053		11,511	2,822,688	466	12.92		
Total	72,909	1,285	43,867	12,564,532	170	$ 4.20	132	$3.98

Ribes Eradication - Colorado and Wyoming.

Ribes eradication work was initiated in Colorado and Wyoming in 1935 with one 48-man camp in Colorado and one 44-man camp operating in Wyoming. The results of the work are shown in the following table:

SUMMARY OF RIBES ERADICATION, COLORADO-WYOMING, 1935

State	Total Acres	Total Ribes	Total Man Days	Effective Man Days	Total Net Cost	Per Acre Basis		
						Ribes	Effective Man Days	Cost
Colorado	2,257	148,504	1,989	1,503	$12,732.32	58.2	.67	$ 5.64
Wyoming	6,126	85,429	1,251	706	9,523.41	13.9	.11	1.55
Total or Average	8,383	233,933	3,240	2,209	$22,255.73	27.9	.26	$ 2.65

Checking Efficiency of Ribes Eradication

Checking work was conducted on all Ribes eradication operations in order to insure a satisfactory condition of control. Any area with more than 25 feet of live stem per acre after working was reworked and rechecked. The checking organization assisted in speeding up the work and reducing costs by running an advance check on areas containing few Ribes in order to block out those areas which did not require working by a crew.

Control Reconnaissance and Preeradication Survey

Inland Empire

Preeradication surveys have been completed in past years on all control areas. Additional information on specific areas is secured through advance check strips run by the checking organization or by operation supervisors and assistants.

California

Control reconnaissance was performed on 83,183 acres on the Plumas, Eldorado and Stanislaus National Forests. As this work was performed by permanent personnel in conjunction with other work, no cost figure has been computed.

Control Investigations

A. Studies in Chemical Eradication Methods

1. Results of 1934 Field Work

Tests of the decapitation method on *R. roezli* showed that Diesel oil is the cheapest and most effective chemical for this species. Borax is not sufficiently toxic for regular eradication work in marked contrast to its effectiveness on *R. viscosissimum*.

In tests of lethal dosage on *R. petiolare* it was found that the application of 250 pounds per acre of sodium chlorate with or without the addition of sodium bicarbonate resulted in a high percentage of kill. The addition of sodium bicarbonate does not affect the toxicity of sodium chlorate and the chlorate-bicarbonate mixture could be used effectively should the price of Atlacide be

increased.

Decapitation tests in Idaho showed that decapitation and chemical treatment of R. viscosissimum, R. lacustre and R. irriguum constitutes an effective eradication practice.

A study of the R. cereum plots in Oregon showed that only those methods which involve the sprinkling of Diesel oil on intact and on decapitated crowns warrant consideration as eradication methods. One hundred percent destruction of large R. cereum clumps can be accomplished by sprinkling the decapitated crowns with an average dose of one-third gallon of Diesel oil per clump.

2. Laboratory and Greenhouse Work

The treatment of Kraft paper bags with a zinc oxide and gum filter through the use of benzene as a volatile vehicle produced a cheap and satisfactory container for packaging ammonium thiocyanate.

A method was devised for the detection and estimation of small amounts of chlorate in soils. Analyses of soils over a period of 3 to 5 months showed that there was no appreciable difference in the rate of decomposition of a mixture of sodium chlorate plus sodium bicarbonate as compared with Atlacide or sodium chlorate alone.

3. Field Work of 1935

Major attention centered on establishing the scope and limitations of chemical methods for the eradication of upland Ribes with the objectives of testing and improving chemicals and the technic of treatment and of demonstrating to field men the use and effectiveness of powdered borax in decapitation work on R. viscosissimum.

Experiments in improving the method of burning brush piles containing turf, Ribes, peat and mineral soil were conducted on the bulldozer operation. Mixtures of sawdust, chlorate and nitrates packaged in one or two-pound bags and fired by fuses were found to be capable of starting lasting fires when used in conjunction with charcoal and dry wood, peat and other fuel. Charcoal or shavings saturated with Diesel oil also make very satisfactory mixtures for igniting brush piles; the cost of these mixtures is low and they are relatively safe to prepare, handle and apply.

Field tests in the chemical eradication of R. montigenum in Wyoming and of R. montigenum and R. cereum in Colorado were undertaken for the first time in 1935.

B. Field Studies of the Rust

1. Pine Disease Survey, Inland Empire

A strip survey was conducted late in the fall of 1935 in order to procure a sample of average infection conditions in the Inland Empire. Of 27,144 pines examined, 417 or 1.54 percent were infected. The heaviest infection

was found on the St. Joe operation where 345 of the 8,350 pines examined or 4.13 percent were infected. The percentage of infection on other operations was as follows: Clearwater, 31 of the 1,677 pines examined, or 1.85 percent; Coeur d'Alene, 37 of the 5,658 pines examined, or .65 percent and the Kootenai-Cabinet, 4 of the 5,980 pines, or .07 percent. No infection was located on the Kaniksu operation through the strip survey. At special inspection points on the Coeur d'Alene operation, 166 of 3,847 pines examined, or 4.32 percent, were infected.

2. Special Pine Infection Study, Clarkia, Idaho

Strips were run south from the Middle Fork of St. Maries River along four section lines east of Clarkia, Idaho. Of the 2,738 pines examined, 480 or 17.5 percent were infected. Of the infected pines, 75.2 percent were within five chains of streams, an additional 22.5 percent were within ten chains and only 2.3 percent were more than ten chains away from streams.

3. Infection Studies at Newman Lake, Washington

The results of these studies are as follows:

a. In 1935, seven years after the initial eradication of R. inerme the reworking of the Newman Lake plot resulted in the removal of 1.9 feet of R. inerme live stem per acre. The amount of this species on the plot as well as its limited distribution has a very minor influence, if any, on the results of the plot studies.

b. There are now 492 R. lacustre bushes on the plot. The number of infected bushes was 38.6 percent of the total.

c. Information from the special study bushes indicated that the peak of telia production was reached about August 26. There appears to be a definite correlation between the distribution of precipitation and the development of telia. The shade class of the bush has a very marked influence on the development of the disease on R. lacustre.

d. In 1935, 16 additional infected trees and 53 additional cankers were found. This is an increase of 8 percent in the number of infected trees, of one percent in total trees on the plot and of 2.3 percent in the number of cankers.

Photographic and Educational Work

In the photographic section 216 ground and 135 aerial pictures were added to the files; 338 copies, 21,432 prints, 1,167 enlargements and 298 lantern slides were made.

In the educational section 40 lectures and two radio talks were given, lantern slides were sent to five universities and 240 pictures, 210 specimens and 12,349 bulletins were distributed.

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was found on the St. Joe operation where 246 of the [illegible] pines examined, or 4.13 percent were infected. The percentage of infection on other operations was as follows: Clearwater, [illegible] of the 1,677 pines examined, or [illegible] percent; Coeur d'Alene, 37 of the [illegible] pines examined, or .65 percent; and the [illegible], 4 of the 5,950 pines, or .07 percent. No infection was located on the [illegible] operation through the strip survey. At special inspection points on the Coeur d'Alene operation, 106 of [illegible] pines examined, or [illegible] percent, were [illegible].

2. Special Pine Infection Study, [illegible], Idaho

Strips were run south from the Middle Fork of St. [illegible] [illegible] four section lines east of [illegible], Idaho. Of the [illegible] pines examined, [illegible] [illegible] percent were infected. Of the infected pines, [illegible] percent were within [illegible] chains of streams, an additional 22.5 percent were within [illegible] chains, and only [illegible] percent were more than ten chains away from streams.

3. Infection Studies at [illegible] Lake, Washington

The results of these studies are as follows:

a. In 1929, seven years after the initial eradication of [illegible], the reworking of the [illegible] Lake plot resulted in the removal of [illegible] feet of R. inerme live stem per acre. The amount of [illegible] on the plot and its limited distribution has a very minor influence, if any, on the results of the plot studies.

b. There are now 498 R. lacustre bushes on the plot. The number of infected bushes was 55.6 percent of the total.

c. Information from the special study bushes indicated that the peak of telia production was reached about August [illegible]. There appears to be a [illegible] correlation between the distribution of precipitation and the development of [illegible]. The shade class of the bush had a very marked influence on the development of the disease on R. lacustre.

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Photographic and Educational Work

In the photographic section [illegible] ground and [illegible] aerial pictures were added to the files; 238 copies, [illegible] prints, [illegible] enlargements and [illegible] lantern slides were made.

In the educational section [illegible] lectures and [illegible] radio talks were given, lantern slides were sent to five universities and [illegible], [illegible] and 1[illegible],249 bulletins were distributed.

SUMMARY OF RIBES ERADICATION, SUGAR PINE REGION
SEASON OF 1935

State	Type of Work	Acres Covered	Effective Man Days (6½ hr. day)	Ribes Eradicated
Oregon	Initial Eradication	12,249	7,883	2,353,152
	Reeradication	6,666	1,663	95,507
	Total	18,915	9,546	2,448,659
California	Initial Eradication	72,909	43,065	12,394,522
	Reeradication	1,285	756	170,010
	Total	74,194	43,821	12,564,532
Grand Total	Initial Eradication	85,158	50,898	14,747,674
	Reeradication	7,951	2,419	265,517
	Totals	93,109 ~~931,090~~	53,317	15,013,191

SUMMARY OF RIBES ERADICATION BY TYPES

Initial Eradication

Type	Acres	Effective * Man Days	Ribes Eradicated	Ribes Per Acre
Timber	51,224	18,657	4,336,466	85
Stream	1,573	2,611	686,782	436
Cut over	19,192	20,049½	7,100,605	370
Brush	869	1,011	270,669	311
R.inerme slash	51	736	-	-
Total	72,909	43,064½	12,394,522	170
		Reeradication		
Timber	-	-	-	-
Stream	55	34	8,169	148
Cut over	840	472	65,389	78
R.inerme slash	390½	250	96,452	247
Total	1,285½	756	170,010	132

*Based on a 6½-hour day.

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